NATIONAL MUSEUM OF VICTORIA

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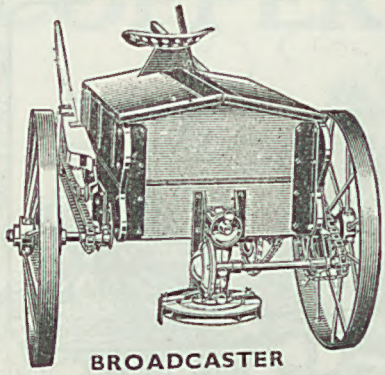

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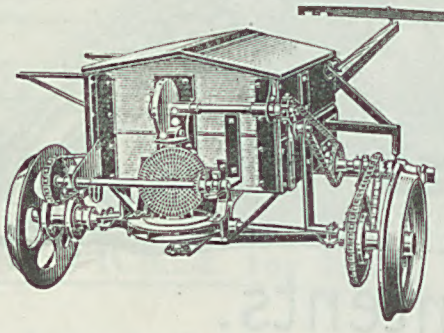

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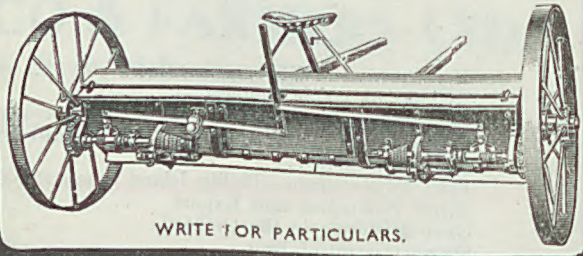

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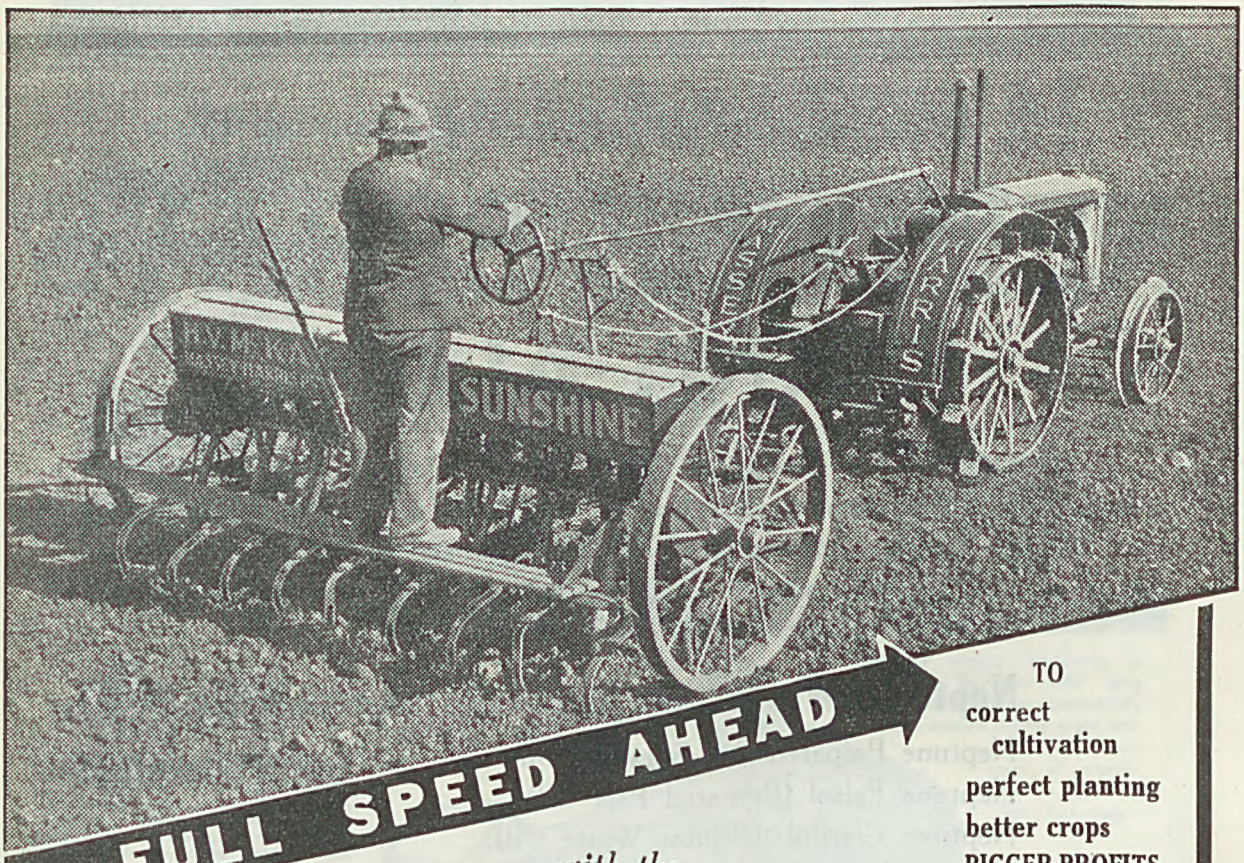

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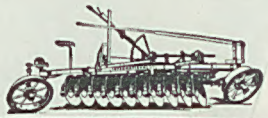

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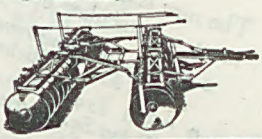

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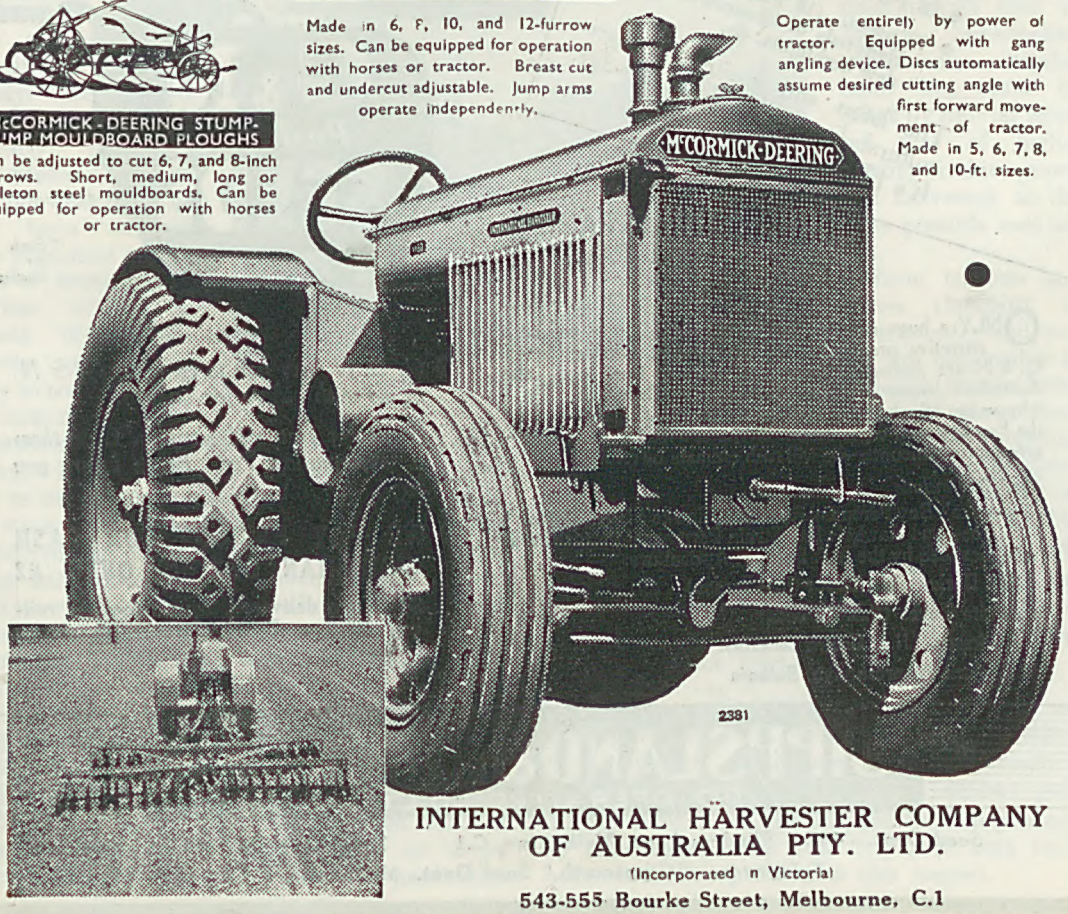

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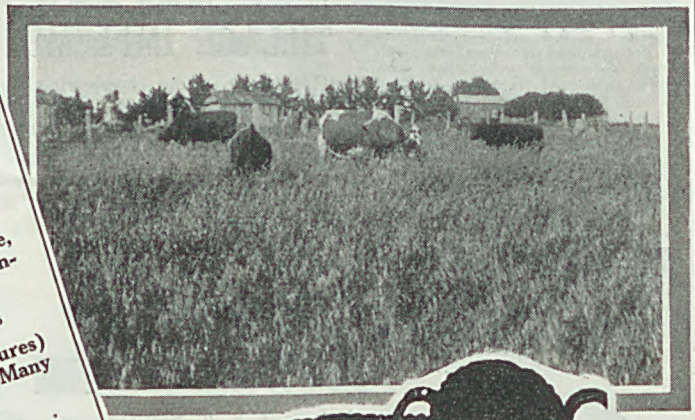

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The Journal of the DEPARTMENT of AGRICULTURE of VICTORIA

Hay Growing in Victoria

By H. C. Wilson, Manager State Research Farm, Werribee.

OATEN hay is the most widely grown in Victoria although large quantities of wheaten, shandy, lucerne, and pasture hay also are regularly produced. All States of the Commonwealth in the past have suffered from periodical visitations of drought and because of these periods of pasture scarcity, which are likely to occur again, it is a national necessity to encourage the production and conservation of fodder. This practice, if regularly carried out, acts as an insurance against lowered yields from live stock during droughts and is also the means of preventing loss of live stock by starvation. Silage and conserved grain such as oats, maize, barley, wheat, and linseed, all play their part if conserved in seasons of plenty to be fed in times of scarcity. Well-grown, well-cured, and properly conserved hay is most palatable when fed to all kinds of farm live stock, and, despite the advent of motor transport and farm tractors, is still in great demand in most of the markets of the Commonwealth.

Cutting a crop of oaten hay.

There has never been greater need for the adoption of scientific methods based on sound practice than at present. Where the production of these important crops is concerned, the present high cost of labour, implements, equipment, suitable land, &c., must be offset by heavier crops per acre of higher quality produce grown and harvested at the least possible cost per ton.

Farm tractors and motor transport in both country and city life are responsible to a degree for the lower prices of these farm commodities in times of plenty, but, in an unusual spell of dry weather, demands of improvident stock-owners would, of necessity, have to be met at advanced prices. The keeping of high quality live stock on the farm runs hand in hand with increased hay production and presents an unlimited market at profitable prices if care in production of the crop and careful management of the live stock kept are practised.

The farmer who produces hay mainly for sale must have his farm within reasonable distance of the market, as the cost of long haulage of such a weighty commodity is a serious item. On the other hand, the hay grower who produces for the wants of his own live stock may be in a less favorable position in this respect.

In districts with an average rainfall of under 24 inches annually and where it is not possible to practise irrigation, the land to be sown should be well fallowed before seeding. Ploughing for winter fallow should be done during the months of July, August, and September, and all the land thus ploughed should be worked thoroughly before harvest starts. If this fallow land is again cultivated after harvest and perhaps immediately before seeding time the following April or May, the labour and added costs of this work will be more than repaid by the increased yield harvested.

Areas to be cropped for hay where the land is of good fertility and the rainfall is ample for the needs of the crop during the growing period, may be sown with probable success without a long fallow preparation, but it is as well to allow for a few months' weathering of the soil between the time of ploughing and that of sowing. Even under the most ideal conditions of soil and rainfall, weeds must be encouraged to germinate and then be destroyed by cultivation before seeding the hay crop. If well done, this practice goes a long way towards high yields and good quality produce at harvest time. The ancient proverb "A crop well sown is a crop well grown" may be well applied to present day practice.

The months of April, May and (sometimes) June are the best months for seeding. It is, of course, a great advantage to be favoured with good early autumn rains of one inch or more before seeding is commenced. Rain recorded in late March or early April should encourage the germination of weeds that can be destroyed by cultivation before seeding the hay crop. This final cultivation after rain will result in a better soil tilth and a much improved germination of the oat or wheat crop sown.

The seed and fertilizer drill should be followed by light harrows and the land finally rolled immediately after harrowing, or at a later date to suit farm routine or soil conditions. Rolling tends to level the land sown and thus enables the farmer to cut his crop with the binder close to the surface with as little loss as possible.

The seed, which should be sown with the fertilizer through the modern drill, should not be covered to a greater depth than 1½ inches on the average in most soils. The quantity of seed and fertilizer to sow will vary considerably according to the kind of crop sown, the variety used, the climate, rainfall, soil, land preparation, and the date of sowing. On the Werribee plains, within 30 miles of Melbourne, where the rainfall averages about 20 inches and the soil is generally a clay loam, the most profitable applications have proved to be 2 bushels of oats and up to 2 cwt. of superphosphate per acre sown on well-worked clean, fallowed land.

Shandy hay—a mixture of Algerian oats and Warden wheat—is also a popular crop on these plains and is sown at the rate of one bushel of oats and three-quarters of a bushel of wheat with 2 cwt. of superphosphate per acre. Wheaten hay, usually of the Warden variety, is sown at the rate of 1½ bushels of seed per acre, also with 2 cwt. of superphosphate per acre on fallow. Seed of the most prolific variety which will suit the district soil and climatic conditions should be selected, and should be well graded and treated for disease before sowing.

Where wheat is grown for hay, provision should be made for a rotation of crops. Oats for hay as an occasional change will tend to prevent the disease "take-all," which is sometimes troublesome where wheat or barley is sown regularly on the same land. If, in favoured districts, it is found after trial that winter fallowing as a preparation for the hay crop is not necessary, the fertilizer most profitable to use is a mixture of superphosphate and sulphate of ammonia. This comparatively new fertilizer is now available

Carting in the hay crop.

Finishing off a well built and well protected stack.

from all the fertilizer firms, and the 1 & 1 mixture should be applied at the rate of 2 cwt. per acre for best results only on land not fallowed.

The date of commencement of harvesting operations will be governed to a great extent by the season, the district, and the crop or variety of that crop sown. At Werribee, it is usual to commence cutting hay about the second week in November. Where large areas are to be harvested with a limited plant, the hay grower is well advised to start harvesting a few days before the bulk of his crop is ready so that his work will be in full swing during the period when his crop has reached the ideal stage. Wheaten hay is best cut with the binder when the grain is well developed but should be cut at least two weeks before the same crops would be ready to be cut for grain.

Oaten and wheaten hay cut with the binder should be stooked in fine weather a few hours after cutting, and the stooks should be well put together to avoid loss of quality through possibly rough, windy, or wet weather. From two to three weeks after stooking, if the weather has been reasonably fine, the hay can be carted and stacked with safety.

Hay stacking is an art and must be done with skill if losses are to be avoided. A good high and dry site should be selected for the stack in a convenient position. Dunnage of some kind should be well placed as a stack bottom. If the district is subject to mouse plagues, a suitable stack stand should be built, or the stack protected by a low iron fence.

The following points may help the hay grower to estimate the quantity of hay that he has harvested ready to stack and should guide him in the size of the stack most likely to accommodate his hay to the best advantage.

1. Take correct drill measurements of the area sown and estimate the area harvested.

2. For every 7-lb. spool of standard binder twine used in harvesting, an average height and quality of oaten or wheaten crop, 3½ tons of hay should result. This will vary a little in relation to the time of cutting, the size and bulk of the sheaves bound by the binder, &c.

3. From 11 to 13 cubic yards of either oaten, wheaten or shandy hay will weigh 1 ton, and this should guide the stacker in setting out his stacks.

4. Oblong stacks with round ends are the most convenient to build. A stack bottom set out with an overall length of 20 yards and a width of 7 yards taken to a height of 6 yards to the turn of the eaves and well-roofed to a height of 4 yards above the eaves should, if moderately sprung, contain approximately 100 tons.

Average costs of oaten hay produced at Werribee Research Farm for the past 25 years on well fallowed land are as follow :—

Cost per Acre.	£	*s.*	*d.*
Rent of land for eighteen months at £10 per acre	0	15	0
Ploughing clay loam at an average of 4 inches deep	0	8	0
Cultivation of fallows, three operations at 3s. each	0	9	0
Seeding operations, two harrowings, drilling and rolling	0	5	0
Graded and pickled seed ..	0	8	0
Superphosphate, 2 cwt per acre ..	0	7	0
Twine and binder work, 2¼-ton crop	0	10	0
Stooking	0	3	0
Carting and stacking (average haulage 1 mile)	0	10	0
Insurance, thatching and sundries	0	3	0
Total per acre	3	18	0

With an average yield of approximately 2¼ tons of hay per acre, produced from well-worked fallow land, the average cost of production of either oaten or shandy hay in the stack at Werribee for the past 25 years, therefore, has been approximately 35s. per ton. Good quality, well-cured and well-stacked oaten, shandy or wheaten hay is always a good investment to the farmer, particularly if it can be produced at a figure approximating £2 per ton. Whatever system of cropping best suits the particular farm should be thoroughly carried out. Badly prepared seed beds, poor quality seed of unsuitable variety, late poorly sown crops, inadequate manurial dressings, defective judgment in cutting and stacking, all help the hay grower to financial difficulties, while crops given the best attention, with due consideration to modern advancements in scientific methods will, on an average, be highly profitable and a pleasure to all who labour in their production.

Analyses of Water Samples

THE quality of bore, well and spring water is always a matter of considerable importance, but in seasons such as this it assumes particular importance. When normal supplies have failed, and when others are failing, it is very necessary to know whether bores or other emergency supplies are suitable for irrigation, stock, domestic, or horticultural purposes.

To assist farmers and graziers during such emergencies the Department for Agriculture will analyse samples of water and report on their suitability for any particular purpose for the nominal fee of 5s. per sample, which should consist of at least 6 oz.

Before putting in expensive pumping plant and reticulation pipes, it is advisable to have a new source of water tested as to its suitability for the purpose in view. Such a test may also prevent untold damage being done to crop or trees, or to stock, by the use of a totally unsuitable and dangerous water.

Samples and inquiries should be forwarded to the Chemist for Agriculture, State Laboratories, Gisborne-street, Melbourne, C.2.

Perennial Rye-Grass

Seed Supplies for Current Sowings

By F. R. Drake B.Agr.Sc. Assistant Agrostologist.

Fig. 1.—General view of rye-grass strain investigation plots at Burnley.

FARMERS intending to sow down permanent pastures this year will be facing a difficult problem. Ruling prices for most kinds of seed are well above the average and supplies of reliable seed are scarce. Taking perennial rye-grass as an example, the quantities sealed under the Victorian certification scheme for the 1936-37 and 1937-38 seasons were 36,736 bushels and 22,120 bushels respectively, while for the current season the quantity is unlikely to exceed 6,000 bushels. This is a striking decrease and a real shortage exists, as there was little carry-over from the previous season, and prices for certified seed have risen to a very high figure. Many farmers will be of the opinion that the present price of approximately 25s. per bushel is too high and will decide to postpone any large scale sowings until next year. Others will be tempted to use cheaper lines of seed that may be offered to them under the name of perennial rye-grass.

In an article in this Journal for December, 1932, an account was given of strain investigation work with perennial rye-grass. A brief summary of this work, together with later observations and experiences, should assist intending purchasers of perennial rye-grass seed in appreciating the risks attending the purchase of other than certified seed.

This earlier work was based on the collection of a large number of samples from all available sources, including a sample from each shipment of rye-grass seed coming into Victoria during the 1930-31 season. It was demonstrated at the time that the great bulk of the seed sold in Victoria was of a type unsuitable for the establishment of productive permanent pastures. The samples obtained were grouped into four main classes as follows:—

1. Victorian grown seed.
2. New Zealand certified seed.
3. New Zealand uncertified seed.
4. Imports from the United Kingdom.

New Zealand uncertified and the United Kingdom imports represented the biggest proportion of the seed on the market, and both failed under critical examination. The New Zealand uncertified seed (chiefly grown in the South Island) proved in most cases to be chiefly that of annual or biennial plants. A few lines were

truly perennial but these were very much in the minority and the use of the term "perennial" rye-grass in the description of the general run of New Zealand uncertified seed is unjustified and misleading. When such seed is sown, a dense leafy and very palatable pasture is produced in the seeding year, but by the second year most of the plants have usually died and the pasture will be thin and unproductive. This is shown clearly in Fig. 2, a photograph of adjoining plots of New Zealand uncertified and Victorian old pasture taken in the second year.

The United Kingdom imports did not show such a markedly non-perennial habit, but from the start most of the plants were small and lacked vigour and generally showed lack of adaptation to Victorian conditions. Sward plots of this type were low-producing and showed marked thinning out after each summer. Fig. 3 shows the difference in vigour between a Victorian sample and an Irish import.

The Victorian grown and New Zealand certified lots were generally satisfactory from the points of view of both productivity and persistence. Some of the Victorian lots proved to be Wimmera rye-grass, but wherever samples were obtained from old pastures in southern Victoria the results were uniformly satisfactory.

Subsequent work has confirmed these earlier findings and the differences between the classes as described above are shown in Fig. 4, and are further emphasized by the following table. This table summarizes the results of growing-on trials involving thousands of single plants. The plants were established in 1936 and final observations made in 1938—the plots being then in their third year.

Class of Seed.	Original No. of Plants.	Plants Showing Weak Recovery.	Deaths.
		%	%
New Zealand certified ..	662	19	2·6
Victorian certified ..	2,606	16	2·1
United Kingdom lots ..	328	40	34·0
New Zealand uncertified ..	96	21	68·0

The results of the trials are self-explanatory, and it has been abundantly demonstrated that, for Victorian sowings, only the Victorian grown and New Zealand certified seed are at all reliable and worth the trouble and expense of sowing.

Up to 1932, the quantity of seed produced in Victoria varied from year to year, but was never large and always inadequate to meet the local requirements of rye-grass seed. At this time also the price of New Zealand certified seed was very high and, as the demand for reasonably priced seed had to be met, there was no alternative for the merchants but to supply the only seed available in quantity—Irish and New Zealand uncertified. The unsuitability of these two classes of seed having been demonstrated, there existed a very strong case for the encouragement of the local industry. This was done, first by a system of district rye-grass growers associations producing seed from fields approved as suitable for the purpose by the Department of Agriculture, and later by the introduction of an official seed certification scheme in the season 1936-37.

Fig. 2.—Second year swards. Left—New Zealand uncertified. Right—Victorian old pasture.

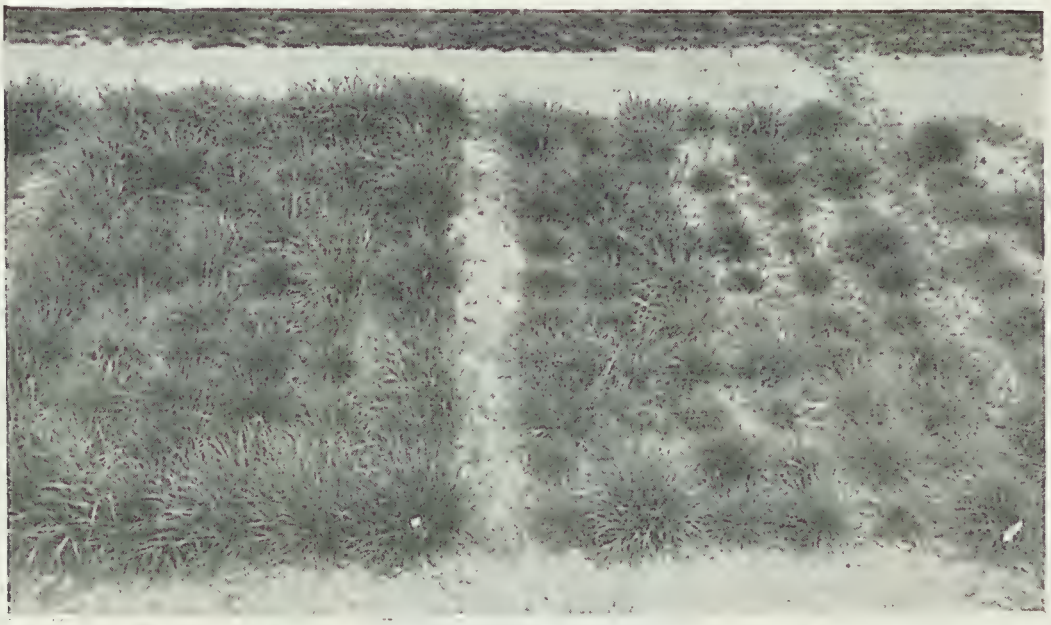

Fig. 3.—Second year single-plant plots. Left.—Victorian old pasture. Right.—Irish rye-grass.

During this first year of the operation of seed certification in Victoria over 36,000 bushels of seed were sealed and the problem of meeting the demand with good seed, and thus displacing the inferior lines from the market, appeared to be solved. With adverse seasonal conditions, however, the quantity has fallen much below requirements and we find ourselves again approaching the conditions ruling up to 1932. The price of New Zealand certified seed is again high and the supply of Victorian seed very light. Another factor in raising the price of Victorian certified seed is the growing preference of many farmers for local strains of certified seed as compared with the New Zealand certified seed, based on a belief that they are better adapted to local conditions, particularly in the lighter rainfall districts.

Large quantities of New Zealand uncertified rye-grass and Irish rye-grass will no doubt be offered at comparatively attractive prices, but all the experience and experimental evidence accumulated over the last ten years leads one to advise against their use, no matter how attractive the price, where productive and persistent pastures are desired. Where the farmer has his mind fixed on the use of Victorian old pasture seed, and this is now usually the case, and where a limited amount of money is available for the purchase of seed, he must either adopt a lower seeding rate or wait until next year.

It will be assumed that wherever perennial rye-grass seed is to be sown, subterranean clover will be sown along with it, or has already been established. In this connexion, the results of a yield trial involving sowings of pure rye-grass, pure subterranean clover and the two species as a mixture, give valuable information. This trial was sown at Burnley in 1935, and although it is not yet complete, four years' results are available, and some striking yield differences from the different sowings have been obtained. The soil on which the plots are established may be described as of low fertility and the rainfall at Burnley may be taken as that of Melbourne, with an average of 25½ inches a year. Rye-grass was sown, both in the "rye only" and the "mixture" plots at the rate of 15 lb. per acre. This rate is well above that in vogue in some districts, but is below that commonly adopted in other districts.

In the first year all the plots containing rye-grass established well and outyielded the "sub. only" plots. In the second and third years, however, the "sub. clover only" plots easily outyielded both the "rye only" and the "mixture" plots, and it was not until the fourth year (1938) that the "mixture" plots caught up to the "sub. only" plots. Taking the total yields over four years, the "sub. only" is still well ahead of the "mixture."

This somewhat unexpected result is explained by the competition between the two plants. Rye-grass establishes from seed more rapidly than does subterranean clover and, in this experiment, took almost complete possession of the ground in the mixture plots and suppressed the growth of the subterranean clover for the first three years. It was not until the fourth year that the subterranean clover became firmly established, was able to compete successfully with the rye-grass and contribute materially to the yield of the pasture.

Subterranean clover is obviously the species which contributes most to the total yield (at least on relatively low fertility soils) and any factor limiting its growth will reduce the productivity of the pasture as a whole. In these plots the rye-grass growing along with it was such a factor, and it may be assumed that a seeding rate of 15 lb. per acre was far too high under the conditions prevailing. As the subterranean clover gradually asserted itself in the mixture plots a reduction in the rye-grass population was noted and at the beginning of 1938 a count revealed that the rye-grass plants remaining represented a seeding of only 4 lb. per acre. With this number of rye-grass plants present the subterranean clover was able to grow normally, as it did in 1938. The inference is, that the other 11 lb. of seed, is represented only by plants which died in the first three years, and this seed was not only entirely wasted, but also its use actually held up the development of the pasture during these three years. Had a seeding rate indicated by the number of plants surviving in 1938 been used for the original seeding, it is almost certain that the subterranean clover would have grown better and that the good, vigorous, and well-balanced pasture which it has taken four years to produce on the mixture plots with a 15-lb seeding would have been produced in two years, and in addition the cost of establishment would have been reduced by the cost of 11 lb. of seed!

It may be argued that, as the "sub. only" plots have, on the first four years' totals, outyielded the mixture plots, rye-grass should be omitted altogether, but after four years the "sub. only" plots are becoming very weedy. Rye-grass is valuable in giving quicker autumn feed, in balancing the pasture and in keeping out weeds. The "mixture" plots slightly outyielded the "sub. only" plots in 1938, and present indications are that the pasture in the "mixture" plots will be easily the best in 1939 with a stable, reasonably weed-free sward, and with the yield spread much more evenly throughout the year than is the case with a pure subterranean clover pasture.

A reasonable deduction from the above results is that on poor soils subterranean clover should be established first as the pioneer species and that rye-grass seed should be sown a year or two later. In developing new country where the initial soil fertility is low, the unrestricted growth of subterranean clover is the only means of building up fertility, and once this has been achieved, rye-grass, if present in the smallest amount only, may be relied on to assert itself, and quickly thicken up in the pasture.

It is recommended, therefore, that seeding rates of perennial rye-grass be carefully adjusted according to the local conditions of soil and climate. Where the building up of soil fertility is the primary objective its use may be postponed, pending the successful establishment of subterranean clover, while for all the poorer soils and lighter rainfall areas, light sowings are more likely to be beneficial than harmful. Seeding rates of as little as 2 lb. per acre may be relied on to ultimately give satisfactory results under such conditions. At such a rate, the price which has to be paid for a bushel of seed loses a good deal of its significance.

Fig. 4.—Single plants of rye-grass in second year. 1. Victorian old pasture; 2. New Zealand uncertified (note stemmy growth); 3. New Zealand certified; 4. Irish-imported.

Certification of Potato Seed

Scheme Approved

By W. J. B. McDonald, B.Agr.Sc., Senior Plant Investigation Officer

SOME years ago a potato known as the New Zealand Pink Eye was very popular among Victorian growers. To-day it is practically unknown, although it had many qualities that would still attract the Victorian grower. If one inquires why the New Zealand Pink Eye faded out of the picture, it is almost invariably stated that it lost its power to produce a profitable crop. Some growers believe that a valuable variety like Carman, the white skin potato most beloved by the Victorian housewife, is drifting towards a similar condition. It is a vital matter to the Victorian potato grower that this tendency of many important varieties to lose productive power should be vigorously countered.

The plant pathologist, or the plant doctor in other words, has little if any hesitation in diagnosing the cause of this loss of vigor as being due to a group of plant diseases known as virus diseases. Virus diseases are widespread throughout the world, and probably have been present in Victorian potato crops for many years, although it is only relatively recently that their importance in the economy of potato production has obtained any local recognition.

Now, a potato plant infected with a virus disease cannot be cured, although on the other hand it probably will not be killed before producing a number of small tubers, all of which may be infected, although it is not possible to discover by tuber examination whether the disease is present or not. If these infected tubers be planted, each one is capable of producing a virus infected plant, so that starting with a small percentage of virus in a crop, it is easily seen that in a year or two a very high percentage of infection can be built up if steps are not taken to combat it, especially when one remembers that the smaller tubers in a crop usually are saved for seed purposes.

An experienced person can fairly readily detect a virus infected plant in a growing potato crop, and it is only by the careful and regular removal of all such plants from a crop designed for potato seed purposes that we can in time free our potato crops from the menace of virus diseases.

The urgent necessity for declaring war on virus diseases is one of the major reasons why the Hon. E. J. Hogan, Minister for Agriculture, recently announced that he had approved of the institution of a scheme for the certification of seed potatoes to commence in the present season. For some years past potato seed certification schemes have been in operation in the United States of America, Canada, England, New Zealand, New South Wales, Western Australia and Tasmania, and in all these countries a marked improvement has been noted both in increased weight of crops and reduction of disease damage, and there is no reason why a similar improvement could not be effected in Victoria.

While the control of the virus disease is one of the main ills which proper seed selection will tend to eliminate, it is by no means the only one which seed certification will tend to control. All diseases which are capable of being transmitted in the tuber will receive a due measure of attention, and seeing these include most of the common diseases of the potato in Victoria, it is confidently hoped the time will arrive when all potatoes sold as seed can be guaranteed free from infection by any recognized disease.

Another important evil which seed certification will tend to control is that caused by damage from the potato moth. In the January issue of this *Journal* Mr. R. T. M. Pescott, Government Entomologist, reported that the most important

Harvesting a prolific crop of potatoes.

spread of the potato moth takes place through the movement of seed infested potatoes. Growers can rest assured that any tubers deemed fit for certification will be free of infection by potato moth. After the experience of the last two seasons, there is no need to stress the damage that can arise as the result of potato moth infestation.

A third important phase of seed certification relates to varietal purity. With the possible exception of the variety Snow-flake, there is a fair admixture of foreign varieties in Victorian potato fields. It is important that a grower should be able to purchase pure lines of seed, and certification will not be granted any crop which contains more than a minimum of foreign varieties.

The grower may reasonably ask just how the Department of Agriculture aims to bring about all these desirable ends through seed certification. It must be frankly stated that a first essential is the hearty co-operation of the growers themselves, firstly by submitting their seed-producing crops to certification, and secondly by carrying out the roguing of those undesirable plants which will be indicated by the field inspectors.

A crop fit for seed production can be determined only after field examinations during the growing period, and after a careful inspection of tubers on digging. This, the Department proposes to do. Any crop entered for certification will be examined at or about flowering time by a Departmental officer, who will make actual field counts to allow him to determine the percentage present of virus diseases, other diseases, unthrifty plants, misses, varietal impurities and any other noteworthy feature.

At this inspection he will indicate to the grower the undesirable plants, and if the crop is of reasonable standard the grower will be expected to remove these and submit his crop to another inspection in about one month's time. If at this second inspection the crop is reasonably free from all objectionable field characters, the produce of the field will be again inspected after digging.

At the tuber inspection, a moderate infection of rhizoctonia and common scab will be allowed, but freedom from late blight, bacterial and other rots and insect injury will be required. Tubers must conform in the main to the characteristic type of the variety and be free from such damage as sunburn, frost injury, cracks or hollow heart.

If the crop passes both field and tuber inspection, the bags will be sealed by the examining officer and labelled inside and out with the name and address of the grower and the variety and grade of the potato. Any bag so sealed can then be regarded as carrying potato seed of a standard well above that generally obtainable.

A number of the better known potato seed growers in the State, especially from Romsey, Beech Forest and Portland, have applied for certification of portions of their crops during the present season. There are a few notable exceptions who apparently prefer to wait and see how the scheme progresses.

It is important, however, that interest in the scheme be not restricted to the regular potato seed growers, as in many districts almost every grower is a seed producer in a small way in so far as he

[*Continued on page* 153.

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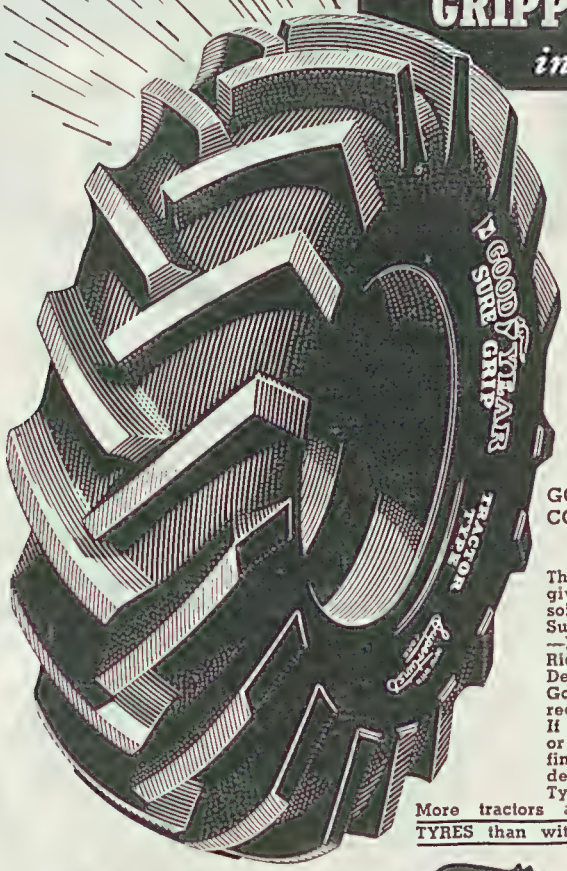

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Subterranean Clover Mixed Strains (1/5½ lb. in cwt. lots)	1/6 lb.
N. Zealand Giant Colonial Cowgrass (1/5½ lb. in ½-cwt. lots)	1/6 lb.
N. Zealand Wild White Clover (2/5½ lb. in ½-cwt. lots)	2/6 lb.
White Dutch Clover (2/3 lb. in ½-cwt. lots)	2/4 lb.
Rape Giant Kangaroo (7½d. lb. in ½-cwt. lots)	8d. lb.
Rape Dwarf Essex (5½d. lb. in ½-cwt. lots)	6d. lb.
Alsike (1/5½ lb. in ½-cwt. lots)	1/6 lb.
Wimmera Rye grass McDougall's strain (12/3 bushel in cwt. lots)	12/6 bushel
Victorian Western District Old Pasture Rye Grass	17/6 bushel

Government Certified Seeds

Victorian Rye grass	25/- bushel
New Zealand Akaroa Cocksfoot Mother Seed	1/8 lb.
Phalaris Tuberosa	5/- lb.
W. Aust. Govt. Cert. mid-season Sub. Cl. (1/8 lb. in cwt. lots)	1/9 lb.
Tallarook Late Subterranean Clover (2/5½ lb. in cwt. lots)	2/6 lb.
Sth. Aust. Govt. Cert. Mount Barker mid-season Sub. Cl. (1/11½ lb. in cwt. lots)	2/- lb.
N.Z. Permanent Pasture White Clover	2/9 lb.

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London Markets

Weekly Prices

The following information as to prices offering in London for the principal Victorian primary products has been taken from cablegrams received each week by the Department of Agriculture from the Victorian Agent-General in London.

Product.	Price for Week Ending—			
	3rd Feb.	10th Feb.	17th Feb.	24th Feb.
	d.	*d.*	*d.*	*d.*
Lamb, 1st quality, Victorian .. .. 29–36 lb. ..	6¾	6⅝	6½	6⅜
Lamb, 1st quality, Victorian .. .. 37–42 lb. ..	6½	6½	6⅜	6¼
Lamb, 1st quality, other States .. .. 29–36 lb. ..	6⅝	6⅝	6⅜	6⅜
Lamb, 1st quality, other States .. .. 37–42 lb. ..	6½	6½	6¼	6⅛
Lamb, 2nd quality, Victorian .. .. 28 lb. and under	6½	6⅜	6¼	6¼
Lamb, 2nd quality, Victorian .. .. 29–36 lb. ..	6	5⅞	5⅞	5⅞
Lamb, 2nd quality, other States .. .. 28 lb. and under	6⅜	6⅜	6¼	6¼
Lamb, 2nd quality, other States .. .. 29–36 lb. ..	5¾	5¾	5¾	5¾
Lamb, 3rd quality, all States .. .. 28 lb. and under	5¾	5¾	5⅜	5⅜
Lamb, 3rd quality, all States .. .. 29 lb. and over	5½	5⅜	5¼	5¼
Mutton wethers and/or maiden ewes .. Under 40 lb. ..	3⅛	3	3	2⅞
Mutton wethers and/or maiden ewes .. 41–48 lb. ..	3	2⅞	2⅞	2⅞
Mutton wethers and/or maiden ewes .. 49–56 lb. ..	..	..	2¾	2¾
Mutton ewes .. .. Under 40 lb. ..	3	2⅞	2⅞	2¾
Mutton ewes .. .. 41–48 lb. ..	2¾	2¾	2⅝	2½
Beef, frozen ox hinds .. .. .. 145–210 lb. ..	4⅛	4⅛	4⅛	4⅛
Beef, frozen ox crops, weights corresponding	3	3	3	3
Beef, chilled ox hinds .. .. .. 145–210 lb. ..	5⅜	5¼	5¼	4¾
Beef, chilled ox crops, weights corresponding	3⅝	3½	3½	3⅜
Pork, Australian 1st quality .. .. 60–80 lb. ..	7½	7½	7⅜	7⅜
Pork, Australian 1st quality .. .. 81–100 lb. ..	6⅝	6⅝	6½	6½
Pork, New Zealand, 1st quality .. .. 60–80 lb. ..	7½	7½	7⅜	7⅜
Pork, New Zealand, 1st quality .. .. 81–100 lb. ..	6⅝	6⅝	6½	6½
	s.	*s.*	*s.*	*s.*
Bacon, Canadian .. .. .. per cwt. ..	90	90	92	92
Bacon, Empire (cured in England) .. .. per cwt. ..	90	88	90	88
Bacon, Danish .. .. per cwt. ..	100	100	100	100
Butter, unsalted, choicest grade .. .. per cwt. ..	121	120–121	120	116–118
Butter, unsalted, 1st grade .. .. per cwt. ..	119–120	118–119	118–119	115–116
Butter, unsalted, 2nd grade .. .. per cwt. ..	..	..	..	..
Butter, unsalted, pastry grade .. .. per cwt. ..	..	..	..	..
Butter, salted, choicest grade .. .. per cwt. ..	119–120	119	118–119	115–116
Butter, salted, 1st grade .. .. .. per cwt. ..	118–119	118	117–118	114–115
Butter, salted, 2nd grade .. .. .. per cwt. ..	117–118	116–117	116–117	112–114
Butter, salted, pastry grade .. .. per cwt. ..	114	113–114	113–114	110
Butter, Danish .. .. per cwt. ..	142	149	144	139
Market (butter)	Firm after an active demand.	Firmer at the end of the week.	Quiet.	Steadier at the end of the week

Farm Improvement

Phillip Island Competition

By D. R. McKenzie, Senior Dairy Supervisor.

Showing the reduction in tussock growth due to improvement by top-dressing with superphosphate. Left: Top-dressed. Right: Untop-dressed.

THE Farm Improvement Competition, inaugurated by the Phillip Island Better Farming League, was designed to raise the standard of farming on Phillip Island. In such a competition, farmers, whose properties and practices are unimproved, are encouraged to carry out improvements which will be of benefit not only to the individual, but also to the district as a whole.

The Competition, which was judged in conjunction with Mr. L. C. Bartels, Senior Agrostologist of the Department, is based on improvements extending over a period of twelve months ending in November each year. Although pasture and stock are made the principal sections of the Competition, points are awarded also for fodder and crops, improvements in clearing, fencing, drainage, water supply, buildings and machinery.

The Island has an area of 24,320 acres and an improved capital value of £443,000. The country is undulating, the soil being of a loamy nature. Although the Island has experienced one of the driest years on record, the competition has been a striking success, dairy farming and sheep raising becoming more important industries. During the past five years a very marked improvement in the herds has been effected. There has been a remarkable increase in the number of pure-bred sires and on several farms which, prior to entry, carried inferior native grasses only, first-class clovers and rye-grass have been established. The success of these farmers speaks volumes for their keenness and enthusiasm. With a liberal top-dressing of superphosphate carrying capacity has been more than doubled.

Mr. R. G. Jeffery, who was second last year, and equal third the previous year, secured first place on this occasion with an aggregate of 24 points for improvements during the year, the improvements covering nine of the thirteen sections of the competition. His property is well developed and consists of 693 acres subdivided into seventeen paddocks with good cyclone fences and swinging gates. Provision has been made for a good water supply, two bores having been put down, one to 125 feet in which the water has risen 40 feet, and is "gaining" at the rate of 200 gallons an hour; and the second to 66 feet wherein the water rose 30 feet. It is Mr. Jeffery's intention to put windmills on these bores and supply each paddock with water.

The stock carried on this property consists of 950 sheep, 480 lambs, 87 cattle including 41 milking cows (pure Ayrshires and grades), 3 horses, 11 yearling heifers and 8 calves. Mr. Jeffery now has a stud of 112 Border Leicester ewes and 2 stud rams which were added during the year.

Plantations again received attention, one area 20 chains by 1 chain and another of 2 acres in one of the back paddocks, being planted with gums and *Pinus insignus*. Seventy chains of new fencing has been erected and 12 acres of scrub and tussocks cleared. The cow-yard has been concreted. Six tons of pressed grass hay is still on the farm from last year. Eight years ago only eleven bales of wool were shorn; this year 27 bales were obtained. Mr. Jeffery's success is due to sound management and thoroughness.

Mr. A. K. Sambell secured second place, his improvements covering eight of the sections with a total gain of 17 points. In the stock section eleven stud rams have been added, also two stud dairy shorthorn cows and three heifers. One hundred chains of cyclone fencing has been erected. The plantation section comprises eight chains of *Cupressus lambertiana;* while 21 acres of gorse has been cleared.

Mr. L. R. Dixon and Mr. W. A. Mallory were equal for third place with a total of 16 points, their improvements in each case covering eight sections. The former scored well in crop, clearing, fencing and water supply, and the latter in pasture, crops, stock, clearing and water supply.

Of the other entrants Mr. H. Justice did well in scoring 15 points, while last year's winner Mr. V. Justice, and Mr. N. McLardy, both with a gain of eleven points over last year's score, deserve credit for their all round improvement.

Stock.

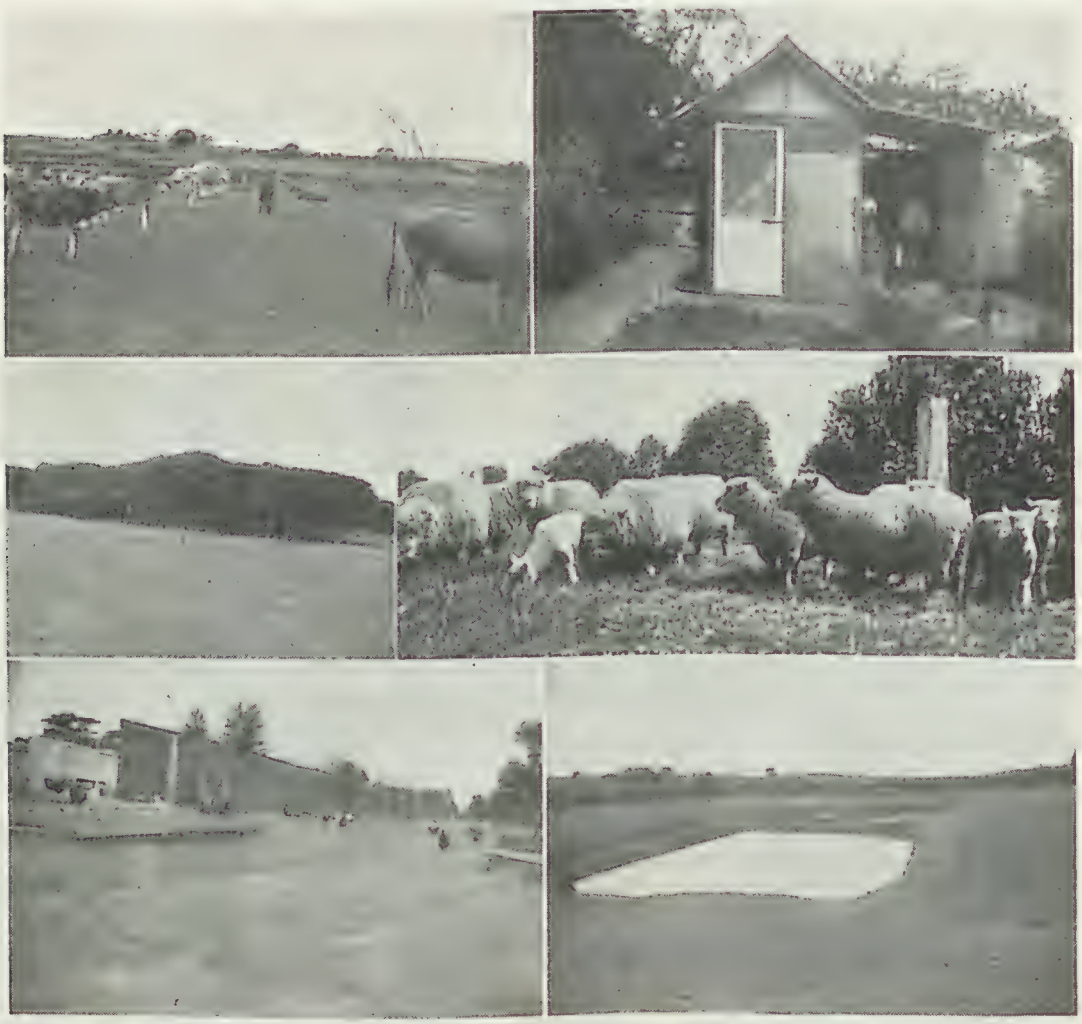
For a long time dairymen on the island were backward in adopting modern methods, but now they are alive to the necessity for keeping abreast with the times. They realize that they must leave the rut if they are to carry on successfully. The first step in this direction has been to raise the standard of their herds, and to replace mongrel sires by animals of better quality. The result is that type and production have been improved and the profits increased. Most of the herds were of mixed origin, but by the use of better sires over the last few years, some are now composed of high grade cattle in which uniformity of type is a marked feature.

The production ability of a cow can be ascertained only by testing. The figures obtained indicate her ability as a producer under existing feeding and management conditions. Subject to the weather these are controlled by the farmer. There is ample evidence available to show that the average herd contains animals which do not produce sufficient butter-fat to pay for the food which they consume. Herd testing is essentially a guide and the figures merely integrate all factors.

A cow returning say £6 per year, costs as much to feed and involves as much labour, &c., in maintenance as a cow showing an income of £15; therefore the profits on payable cows are reduced by duffers in the herd. The remedy

INCREASES IN POINTS AWARDED FOR THE TWELVE MONTHS ENDED NOVEMBER, 1938.

Name of Owner.	Pastures.	Fodder and Crops.	Stock.				New Plantations.	Clearing.	Fencing.	Drainage.	Water Supply.	Buildings, Additions, and Renovations.	Machinery.	Total Points.
			Male.	Female.	Young Stock.	Uniformity Health and Appearance.								
Jeffery, R. G.	7	7	½	1	1	..	2	1	2	..	2½	..	..	24
Sambell, A. K. T.	1	8	1	2	1	..	½	1	2½	..	..	..	..	17
Dixon, L. R.	1	7	..	1	..	..	1	1½	..	..	2	..	½	16
Mallory, W. A.	3	7	½	1	½	..	1	1	..	..	2	..	..	16
Justice, H.	5	5	..	1	1	½	..	½	..	..	2	..	..	15
Dixon, W. B.	4	4	½	1½	1	..	..	2	..	..	..	..	½	13½
Justice, V.	..	7	..	..	..	..	..	1	..	..	2	1	..	11
McLardy, N.	6	2	..	1	½	½	1	—1	..	..	..	1	..	11
Gliddon, J. W.	1	3	1	1	½	½	..	1½	..	..	½	..	..	9
Graydon, J. B.	—2	3	..	1	½	..	½	..	½	..	½	1	1	6
West, A. E.	3	..	..	..	..	..	..	½	½	..	..	..	..	4
Roberts, J.	2	..	..	..	..	..	..	..	½	..	..	..	..	2½
Parry, W. H.	—1	..	..	..	..	..	..	..	1	..	..	..	..	0



Top left.—Some of Mr. L. R. Dixon's herd. Top right.—Mr. N. McLardy's dairy. Centre left.—A good shelter belt of native ti-tree on Mr. K. Sambell's property. Centre right.—Some members of Mr. W. A. Mallory's stud flock. Bottom left.—Poultry pens (Mr. N. McLardy). Bottom right.—A new dam on Mr. L. R. Dixon's farm.

is to test and milk only payable cows. Many dairy farmers have been able to cull animals which show a dead loss, but still a large number cling to the old idea of milking anything that is a cow without knowing whether she pays or not. "Don't keep the cows, but make the cows keep you."

Too much importance cannot be laid on the fact that only first-class rams should be purchased to mate with the breeding ewes. Rams of a good even type, well-woolled, strong-boned, and of strong constitution, that have been reared under conditions which should enable them to do well under local conditions, should be sought. Some excellent rams were to be seen on the properties of Messrs. R. G. Jeffery, A. K. Sambell, W. A. Mallory and J. W. Gliddon.

The section for horses has always been a strong one, some attractive looking foals being inspected on the properties of Messrs. L. R. Dixon, W. A. Mallory, and W. B. Dixon.

Only a few years ago the pig was regarded more or less as a necessary evil by the dairy farmer. To-day things are totally different, simply because the animal has become a recognized source of income. The pig in its relation to the cow does not take any secondary place, as a sow if properly looked after, will return

almost as much as one cow. It is recognized that for pig farming to be profitable it is necessary for a farmer to breed his own pigs. It is now possible to eliminate many faults, as rapid progress has been made during recent years with the science of breeding. During the year, Mr. W. B. Dixon purchased a Middle York boar and two sows.

The uniformity of the young stock was most noticeable. Undoubtedly this is due to better sires. Some very fine heifers were inspected on the farms of Messrs. Jeffery, Sambell, H. Justice, J. B. Graydon, L. R. and W. B. Dixon. Improvement was also to be seen in the lambs on the properties of Messrs. Sambell, L. R. Dixon, Jeffery, Mallory, and J. W. Gliddon.

Other Improvements.

It is most gratifying to report that during the year further improvements, as compared with previous years were carried out in regard to plantations. Where provision of shelter is the primary consideration, various species of cypress, sugar-gum and mahogany gum are the most reliable for growing on the island. They are fast growers and give excellent shelter. If it can be so arranged, a windbreak in the form of a T is the most effective, as it affords protection from winds from all quarters. Messrs. Mallory, Jeffery, L. R. Dixon, and Sambell have improved in this section.

A large amount of clearing has been done, but more attention should be given to cutting the bracken ferns, sword grass, gorse and tussocks. Twenty-one acres has been cleared by Mr. Sambell, 26 acres by Mr. J. W. Gliddon, 15 acres by Mr. L. R. Dixon, and 12 acres by Mr. Jeffery, while 25 acres of scrub were burnt by Mr. W. B. Dixon.

Large paddocks on a farm are not economical. If practicable it should be subdivided into a number of small paddocks allowing each to be grazed in turn, then spelled for a period to enable the paddock to recover. Large paddocks mean wastage, as the stock roam over the area eating out the choice grasses, fouling the remainder, and making the herbage unfit for food. Many new fences were seen. Reference has been made already to that on the properties of Messrs. Jeffery and Sambell. In addition there were 34 chains at Mr. L. R. Dixon's, 15 chains at Mr. Parry's and 2 chains at Mr. J. Roberts'.

Water supply has again received attention. As previously mentioned two bores have been put down on Mr. Jeffery's farm, and new dams were inspected on the farms of Messrs. V. Justice, H. Justice, L. R. Dixon, and W. A. Mallory. The subdivision of paddocks, increased number of stock, and insurance against dry seasons, are essential to improve this section to its utmost.

Mr. McLardy has erected a new hay and machinery shed and has had three bails concreted. Mr. J. B. Graydon has built a new kitchen and Mr. Jeffery has had his cowyard concreted.

Generally the machinery is in good order and repair and on most farms kept under cover. A new 2½ horsepower petrol engine, top-dresser and

Good cultural practice has ensured a satisfactory crop of maize, despite dry conditions, on the property of Mr. A. R. Jeffery.

trailer were inspected on Mr. J. B. Graydon's property. Messrs. L. R. and W. B. Dixon have purchased a new mower.

There were four new entrants this year, namely, Messrs. F. B. Morgan Pyler, A. R. Jeffery, John Graydon and P. G. Trew.

There is every reason for satisfaction with the progress made; in fact the judges had no hesitation in stating that on the whole there had been a steady and definite improvement in comparison with the previous year. What is more, the beneficial influence of the work is spreading, slowly but surely, so much so that a solid foundation has been laid. Naturally the completion of the work is a slow process but this is inevitable, as over-haste is not conducive to good work.

Butter Production and Export

The following table shows:—

(*a*) Factory production of butter and cheese in Victoria for the period July to December, 1938, compared with the corresponding period of 1937.

(*b*) Quantities and percentages of various grades of bulk butter examined in Victoria for export during the period July, 1938, to January, 1939, in comparison with the corresponding period of 1937-38.

FACTORY PRODUCTION OF BUTTER AND CHEESE IN VICTORIA (QUANTITIES IN TONS).

Month.	Butter.		Cheese.	
	1938.	1937.	1938.	1937.
July	2,165	2,336	289	259
August	3,502	3,557	439	394
September	5,624 (*)	5,999	863	719
October	7,744 (*)	8,823	1,508 (*)	1,020
November	7,630 (*)	9,549	1,534 (*)	1,068
December	6,375 (†)	8,144	1,258 (†)	986
Totals—6 Months	33,040†	38,408	5,891†	4,446

* Revised. † Subject to revision.

BULK BUTTER EXAMINED IN VICTORIA FOR EXPORT (QUANTITIES IN TONS).

Month.	1938-39. How Graded—				Total.	Month.	1937-38. How Graded—				Total.
	Ch.	1st.	2nd.	Pty.			Ch.	1st.	2nd.	Pty.	
July to December	13,336	3,535	866	62	17,799	July to December	15,484	6,026	1,106	63	22,679
January ..	1,828	1,146	409	46	3,429	January ..	2,954	1,874	431	16	5,275
Totals—7 Months ..	15,164	4,681	1,275	108	21,228	Totals—7 Months..	18,438	7,900	1,537	79	27,954
Percentages ..	71·4	22·1	6·0	0·5	..	Percentages ..	66·0	28·2	5·5	0·3	..

Green Manuring in the Orchard

By G. W. Gayford, B.Agr.Sc., Assistant Horticultural Research Officer.

THE practice of growing green crops in the orchard during the winter months is fairly widespread. The value of this phase of orchard management is not always fully appreciated however, and, consequently, it is looked upon as a job which can receive attention after all other work is completed. This outlook very frequently results in the sowing of green crops being left until it is too late for seeds to receive the advantage of a warm seed bed, or the practice may be completely neglected for the winter.

A green manure crop of tick beans grown at Batesford.

A green crop is beneficial from the commencement of growth until it is ploughed under, and it has a residual effect on general soil fertility. Where clean cultivation has been practised for a number of years, there is a tendency for the development of a "hard pan" or "plough sole" at the depth of ploughing, and this restricts the feeding zone of tree roots. A good growth of green crop tends to break down any such consolidation.

During the winter, lack of drainage is often a problem on orchard soils, and trees suffer when they have been under water for a number of weeks. This trouble may be removed, to a large extent, by the early establishment of a green crop. This will require large quantities of water for growth and so will prevent the development of wet conditions.

Another problem of orchardists which is prevented by green manuring, is soil erosion, or "washing" during the winter. Many growers will have noticed the "gutters" which form on sloping ground, but, in the majority of cases soil erosion is an insidious thing which goes on unnoticed for a number of years. The foliage of a green crop lessens the force of a heavy downpour, and its roots cling tenaciously to the soil particles and so prevent their removal.

Most growers realize that when a bulk of vegetable material is incorporated in the soil, it provides a valuable addition to the stock of soil humus. The humus content of soil is very important to plant growth. Most notable is its effect on soil structure. Humus greatly improves soil structure, and this makes for easier ploughing. Such soil does not become sticky when wet and it does not set like concrete when dry, as do soils deficient in this important soil constituent. Another factor in the addition of humus is that it increases the water holding capacity of the soil. This means that the soil is capable of taking up a larger amount of water without becoming "wet" and, due to the beneficial effect on soil structure, the amount of water available to the tree is increased. This is of particular importance under dry conditions.

During the winter, green crops require certain mineral nutrients for healthy vigorous growth. These are not obtained from the soil at the expense of the tree because its growing period has ceased. Instead of being leached from the soil, as would be the case with clean cultivated soil during the winter, soil nitrates are retained by green crops. In the case of leguminous crops such as peas, tick beans, and lupins, nitrogen from the air is incorporated in the plants. The potash, phosphates, nitrates, iron, lime, and other mineral constituents are released when the plants are ploughed into the soil in the spring, and are more readily available to the tree than the minerals already in the soil. Thus we see that green crops act as a bridge which carries

A prolific crop of tick beans grown under irrigation at Mildura.

minerals across the winter so that they are made available to the trees in the following spring.

On ploughing a green crop under, it is immediately attacked by the millions of soil organisms which are so important a part of the surface layers of the soil. These unseen organisms are workers in a factory, breaking down elaborated plant material into simpler substances which form the humus of the soil and the plant nutrients, which are essential to the growth and vigor of the tree.

When the crop is first ploughed under, the incorporation of such large quantities of carbohydrates rather upsets the balance between carbon and nitrogen in the soil. The soil organisms require nitrates to break down this material, consequently the soil nitrates are depleted, but in from four to six weeks, the soil nitrates commence to increase. Where leguminous crops have been grown, the upset in carbon-nitrogen balance is not so great because of the higher nitrogen content of such plants, and the final contribution to soil nitrates is much larger than it is for cereal crops. However, the slow liberation of nitrates into the soil is very valuable, particularly in the case of citrus orchards with their high nitrogen requirements, and their susceptibility to injury by the application of large quantities of artificial fertiliser.

Cultural Practice.

Two methods are used to obtain a growth of green-stuff in the orchard. The ground may be ploughed and some cereal or leguminous crop sown, or, on the other hand, the miscellaneous herbage common to that particular area may be allowed to grow up during the autumn.

The former method usually brings the best results because some plant is introduced, the growing period of which fits in very well with the time available and the climatic conditions of the particular area. In order that best results may be obtained, early sowing is essential. This means ploughing and sowing in March, weather permitting. Provided the required soil moisture is then available, either from natural rain or irrigation, the seed will germinate well. There should then be a sufficient period of warm weather for a good growth of green stuff to be obtained. If this growth is not obtained before the winter, the crop will not have time to develop properly before ploughing is required in the spring.

Most growers will object to this early sowing on the grounds that it will interfere with their picking operations, and if the crop was sown it would be trampled down by pickers and vehicles. Even so, many growers have managed to sow their crops early by cropping alternate lands in alternate years.

The other alternative in green crop practice and one which recommends itself because of its

A cover crop of oats and barley, Batesford.

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cheapness, is to allow the natural herbage to grow in the autumn by foregoing any cultivation. It is far better to neglect the orchard ploughing rather than remove the natural plant growth and then not sow a crop at all. Where natural weeds occur, such as capeweed, excellent stands, up to three feet in height, have been obtained. If suitable plants which will provide a bulk of green-stuff are not present on the orchard, it would be advisable to introduce seeds of such a plant as subterranean clover or capeweed. Subterranean clover may not have time to set seed before ploughing, so that it would be necessary to miss the cultivation of a strip of ground between the trees, and so allow the clover to come to maturity.

Showing a dense growth of capeweed brought about, in this case, by the addition of nitrate of soda.

Ploughing in the Autumn.

Early ploughing in the spring is essential in green-crop practice, and there are a number of important reasons for this.

In the first place, the upset to the nitrogen content of the soil, when the crop is first ploughed under, may hamper the blossoming of the trees and result in a poor fruit set. If, however, the crop is ploughed early so that decomposition has well advanced by blossoming time, the increased nitrates, which have become available by this time, will add to the vigor of the trees.

Green crops which have advanced into a stage of maturity are not so easily decomposed, and have not such an even distribution of mineral nutrients throughout their substance as young succulent crops. It has been shown that the most rapid decomposition and the most rapid accumulation of nitrate nitrogen occur when the green crop is ploughed into the soil in the most succulent stage.

If ploughing is delayed until the trees have commenced activity, the drain on soil moisture by the green crop may, in some seasons, seriously deplete the supply available to the trees. On irrigated orchards the green crop should be ploughed under before the first spring irrigation. On apple and pear orchards the risk of black spot infection is largely reduced if ploughing can be done before bud-burst.

Manurial Requirements of Green Crops.

The most obvious mineral deficiency in Victorian orchard soils is nitrogen. Green crops will not be successfully established unless some previous practice such as applications of organic or artificial nitrogen containing manures has raised the soil nitrogen content, or either sulphate of ammonia or nitrate of soda are broadcast with the green crop seed. Either of these fertilisers will produce a green, healthy growing crop when applied at the rate of 1 cwt. per acre. These are of importance in the case of cereal crops, and even leguminous crops with their power of nitrogen fixation have been shown to benefit greatly by such applications. The latter crops also show response to the addition of superphosphate at the rate of 2 cwt. per acre.

Where the growth of natural herbage is relied on, it will be greatly stimulated by broadcasting sulphate of ammonia at the rate of 1 cwt. per acre. By this means, very good stands of capeweed have been obtained. Clovers respond to dressings of superphosphate at 3 cwt. per acre. In soils of high acidity, the growth of leguminous plants will be assisted by liming. Burnt lime and slaked lime are the types usually favoured by orchardists, and should be applied at the rate of from 10 cwt. to 30 cwt. per acre.

Plants for Green Manuring.

Oats, barley, and rye have been successfully used for green crops. Barley is less susceptible to soil acidity than oats, and both plants are able to make some growth in cold weather. The rate of seeding for cereal crops should be one bushel per acre. Leguminous plants are largely favoured because of their nitrogen-fixing powers. Field peas have produced excellent results and tick beans grown under irrigated conditions

[*Continued on page 125.*

Swarm Control of Bees

By J. S. Eagland, Apiary Inspector.

TO fully appreciate the difficulty facing an apiarist in trying to control swarming among the hives in his apiary it is necessary to have some knowledge of the reason for such behaviour on the part of the bees. With most animal life natural increase comes by the birth of their young in small numbers and surviving as individuals, but in the case of bees a colony has individual hatchings of young bees occurring continuously, and often at the rate of over a thousand per day, while the natural rate of wastage of old bees is on about the same level.

Under certain conditions, however, the rate of increase exceeds the death rate and the colony becomes so crowded that more room is needed. This condition is relieved by a swarm leaving the parent colony and setting up a new colony elsewhere. This swarm represents true increase and is the bees' way of propagating or continuing the existence of the species. The instinct to continue the race is as strong in the bee as in any other form of life, and swarm control is an effort to retard or control this very strong law of nature. To attain any success the

A swarm shaken in front of a hive.

operator must have a reasonable knowledge of the habits of the honey bee and the normal condition of the inside of a hive of bees.

Swarming occurs mainly in late spring, from October until early December, but may also occur at other times of the year. The principal causes of swarming are, first, a crowded condition in the hive; second, an abundant supply of pollen together with a light honeyflow; and third, an old or failing queen at the head of the colony.

To relieve the first condition the operator can give more supers of combs as needed, but skill is sometimes necessary to induce the bees to avail themselves of these added combs to their maximum value. There are various ways of getting the bees to occupy these combs, the more common being to interchange empty combs for combs already partly filled with honey in the lower part of the hive, or even the brood may be interchanged. It is impossible to give any set rule for this work and each hive must be handled according to its condition at the time, with due allowance for future development as may be desired.

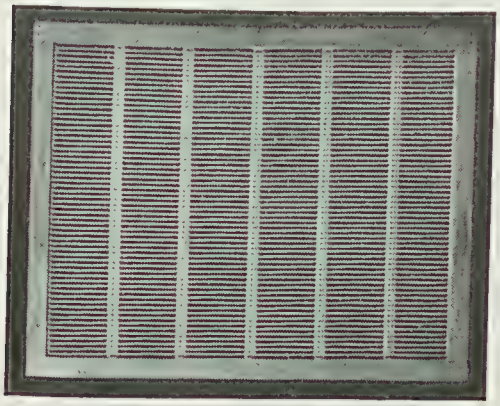
The second condition, an abundance of pollen and honey, is one to be desired, and provided excessive crowding and consequent swarming can be prevented, should result in the storing of considerable surplus honey. The third condition, a failing queen, can, when circumstances are favorable, be rectified by requeening the colony and this work should be consistently carried out whenever opportunity offers.

Once a colony has definitely commenced preparing to swarm, which is indicated by the building of queen cells, more drastic treatment

is necessary. The method most commonly used is to take away most of the brood and replace it with empty combs or with frames of foundation, the brood being given to weak hives to assist them to build up.

When all weak hives have been brought up to normal strength, and provided no increase is desired, the "Damaree" method of control may be used. The procedure adopted is to destroy all queen cells, then remove all the brood, except one comb, from the brood nest and replace with empty combs, a queen excluder is then placed on top of the brood nest and the brood previously removed is returned above the excluder.

It is essential that the queen be kept in the bottom box, or brood nest as it is termed, and to be sure of this it is usual to shake all bees off the combs to be placed above the excluder. These brood combs must be examined again eight days later and all queen cells again destroyed. It may be found necessary to repeat the whole treatment in about three weeks if queen cells are again started in the brood nest.



A queen excluder (10 frame size).

Should the bees persist in wanting to swarm it may be better policy to divide, or artificially swarm them. The practice is to first find the queen and place her, with one comb of brood and bees, into a spare brood nest of empty combs, then remove the parent hive to another position near-by and place the spare hive in the old position. During the next few days there will be a heavy drift of field bees from the parent hive to the division, so creating a condition similar to a swarm, while provided one queen cell only is left in the parent hive, it should not swarm, and the cell will in due course provide the queen necessary to head the colony. If no increase is desired these colonies may be united again, any time after the young queen has been laying for about nine or ten days.

There are many minor factors contributing to the desire of bees to swarm and many and varied practices adopted for control. Remember, however, that no method is fully successful and whatever method is adopted will usually result in failure unless intelligently applied, while under some conditions success is practically unattainable no matter what is done.

Green Manuring in the Orchard

(*continued from page* 123).

produce a large bulk of green stuff. Leguminous crops should be sown at the rate of 1½ bushel, per acre. Combinations of cereal and legumes such as peas and barley, or oats and vetches sown at the rate of half a bushel of cereal, plus three quarters of a bushel of legume per acre, are recommended, because the peas improve the nitrogen status of the soil to the benefit of the barley. Lupins produce a bulk of green material and grow in slightly acidic soils which prevent the full development of other legumes. Under irrigation, sweet clover (*Melilotus indica*) will provide a bulk of material.

Conclusions.

The need for an addition to the organic content of orchard soils is met by growing green crops during the winter.

Green crops when well established preserve soil nutrients, which become of benefit to the trees during the spring when the crop is incorporated in the soil.

A good growth of green crop will prevent soil erosion, and have a beneficial effect upon the physical properties of the soil.

Early sowing and the use of artificial fertilisers are essential to the successful establishment of green crops.

Dimboola Crop and Fallow Competition, 1938

*Report of Judges,: H. L. Hore, B.Agr.Sc., Inspector of Agriculture, and A. C. Doery, B.Agr.Sc., Science Field Officer.**

WITH a rainfall of 867 points in the past year—only 19 points more than the lowest ever recorded there, and approximately 7½ inches below the average for the past 60 years, the Dimboola district was able to produce wheat crops, the best of which would yield over 24 bushels per acre. This was a very fine achievement and was attributed, in some measure, to the fact that good rains were received in the latter half of 1937. There is little doubt that by the modern methods of fallowing some of this moisture was conserved in the soil and was of assistance to the crop during the dry spring months.

Wheat Varieties.

The most popular wheat variety in the Dimboola district, as in other parts of the Wimmera, is Ghurka, and 37 per cent. of the crops inspected were of this variety. Coupled with its heavy yielding ability is a high degree of resistance to flag smut disease and rust, and, in addition, this wheat has good harvesting characteristics.

One-third of the exhibits were sown with Free Gallipoli, which maintains a fair measure of popularity on account of its reliability and the fact that it is taller in the straw than Ghurka. Another taller growing wheat than Ghurka is available in the variety Dundee which comprised 22 per cent. of the competition crops. Departmental tests to date indicate that Dundee is not equal to Ghurka or Free Gallipoli in yield on the black Wimmera soils. On red ground, however, Dundee has given better results and is recommended for limited sowings on this type of land. Baldmin, which is an early-maturing tall growing variety, the grain of which produces flour of "medium-strong" quality, is worthy of a trial in either the black or red soils. Its main weakness lies in the fact that unless harvested promptly the straw may break and choke the comb of the harvester.

Rance 4H and Bobin were each represented by a single entry in the competition.

Wheat Diseases.

Loose smut (or blow-smut) was present, but only to a minor degree, in most entries. In the crops inspected it would not be responsible for any noticeable diminution in yield, but on occasions the disease can be quite serious. The characteristics of the disease are that the heads produce, in the spring, a mass of loose black powder which is later blown or washed away, leaving the bare backbone of the wheat at harvest. The black powder referred to constitutes the spores or seed material of the disease and is responsible for infection of subsequent crops. The spores infect the grain in its very early stages of development and the disease becomes enclosed inside the kernel which, to outward appearances, shows no indications of infection. Being located inside the grain of wheat the loose smut fungus does not come in contact with pickling agents and is therefore not controllable by pickling the seed. If loose smut is present to an appreciable extent in a crop it is advisable to obtain fresh seed from crops which are as free as possible from the disease.

Flag smut was present in every crop of Free Gallipoli inspected in the competition and in a few cases the infection was quite heavy. In two crops of Dundee this disease was also noticeable, whereas all entries of Ghurka were free of flag smut. The growing of this latter variety offers a ready means of overcoming the flag smut problem in paddocks where the disease is known to exist.

It was somewhat disturbing to find that 11 of the 27 crops inspected showed ball-smut infection, although the seed in one case had been wet pickled and the remainder dry pickled.

By using a sufficient quantity of reliable copper or mercuric powder, an efficient pickler, and paying strict attention to the process of pickling it is possible to eliminate this disease. Copper powders should be applied at 1½ oz., and mercuric powders at not less than 1 oz.

* Mr. Doery judged sections 1 and 5 and Mr. Hore the remainder of the competition.

per bushel of seed. This, in itself, it not sufficient as it is essential that the powder be evenly distributed so that each grain becomes coated with the pickling agent.

The Competition Crops.

Most of the crops were sown in mid-June though on the lighter land some were planted in May. Early growth had been vigorous but the lack of rain in the spring had affected all entries and "tipping" was common. The grain, however, was bright and well filled, and this contributed to some extent to the yields obtained. The quantities of seed and superphosphate used both varied from 70 to 110 lb. per acre, the average dressings being 83 lb. of seed and 93 lb. of superphosphate per acre, while one competitor had applied zinc sulphate with the manure. The outstanding results obtained from the use of zinc sulphate in the Nhill district and elsewhere in the Wimmera warrant farmers in the Dimboola district at least trying this mineral on small areas sown to wheat this year, using approximately 5 to 10 lb. per acre with the superphosphate.

In only a few cases were the competition crops fed off and good comparisons of the effect of this practice on bulk crops were not available. Experimental evidence, however, indicates that feeding off the crop causes a diminution in the grain yield. Factors influencing the recovery of a crop after grazing are the season, severity of feeding off, the amount of seed originally sown, and the variety used.

Section 1.

The best crop, and winning entry in this section was that of Dundee grown on Mr. V. H. Harders' No. 2 fallow entry.

This crop was more dense than the average and was exceptional in that only a small portion of it had suffered from "tipping" of the head. Although the ears were small the grain was fairly well filled. Mr. Harders had scarified this entry in June and August and worked it with the combine in October. It was then scarified in January, and after another working with the combine in early April, the area was sown in mid-June.

Mr. E. F. Jensz gained the second award with a crop of Free Gallipoli. This entry was short, but very clean and free from "foreign" heads. It had the basis of a high yield but had been severely tipped and was expected to yield less than the winning crop. The land had been summer fallowed in March, scarified in July, harrowed in August, scarified in September, combined in October, harrowed in November, combined in December and January, harrowed in March, and combined again in early May, prior to sowing in June.

Section 2.

Mr. H. F. Budde's crop of Dundee was a very creditable entry, and was grown on one of the best fallows judged in 1937. The land had been summer fallowed with the scarifier in March, scarified and harrowed in July, August, October, and November, and harrowed with shear points attached in December and January. It was worked with the knifebar and harrows in February and the crop was combined in and harrowed during the second week in June, 85 lb. of ceresan-pickled seed and 103 lb. of superphosphate being sown per acre. The crop had been very lightly grazed.

Messrs. Westendorf Bros. No. 2 entry, grown on a well prepared fallow was also an excellent crop, but a considerable amount of "tipping" of the heads was noticeable.

Section 3.

Crops in this section reflected the adverse season very markedly and the average yield would be little over 10 bushels per acre.

Section 1.—Best 50 Acres Mallee Land Fallow 1937, and Crop Grown Thereon 1938.

Competitor.	Variety.	Yield.	Purity and Type.	Absence of—		Evenness.	Crop Total.	Fallow 1937.	Aggregate.
				Weeds.	Disease.				
Maximum Points	.. .. ..	**35**	**20**	**15**	**15**	**15**	**100**	**100**	**200**
V. H. Harders, No. 2 ..	Dundee	18	18	13	14	14	77	95	172
E. F. Jensz	Free Gallipoli ..	13	19	14	13	14	73	96	169
V. H. Harders, No. 1 ..	Ranee 4H ..	14	19	13	14	13	73	95	168
V. H. Harders, No. 3 ..	Free Gallipoli ..	13	19	14	13	13	72	93	165
V. H. Harders, No. 4 ..	Free Gallipoli ..	13	19	14	13	13	72	93	165

SECTION 2.—BEST 50 ACRES OF FALLOW ON LAND OTHER THAN MALLEE OR MALLEE FRINGE LAND 1937, AND CROP THEREON 1938.

Competitor.	Variety.	Yield.	Purity and Type.	Absence of—		Evenness.	Crop Total 1938.	Fallow Total 1937.	Aggregate.
				Weeds.	Disease.				
Maximum Points		**35**	**20**	**15**	**15**	**15**	**100**	**100**	**200**
H. F. Budde, No. 2	Dundee	30	18	14	13	13	88	99	187
Westendorf Bros., No. 2	Bobin	29	19	14	13	13	88	98½	186½
A. H. Walsgott	Ghurka	26	19	14	14	14	87	99	186
M. K. Fechner	Dundee	29	18	13	13	13	86	96½	182½
Westendorf Bros., No. 1	Free Gallipoli	25	19	14	13	13	84	98½	182½
A. H. Walsgott, No. 2	Ghurka	23	18	14	14	13	82	99	181
H. F. Budde, No. 1	Ghurka	22	19	13	14	14	82	99	181
M. K. Fechner, No. 1	Ghurka	20	19	13	14	14	80	97	177
S. E. Jorgenson, No. 2	Ghurka	21	18	14	14	13	80	96½	176½
H. E. Holland, No. 2	Ghurka	22	18	13	14	13	80	95½	175½
A. H. Pietsch, No. 2	Free Gallipoli	20	19	13	12	12	76	98½	174½
S. E. Jorgenson, No. 1	Ghurka	19	18	14	14	13	78	96½	174½
M. K. Fechner, No. 2	Free Gallipoli	19	18	12	14	13	76	97	173
H. E. Holland, No. 1	Dundee	20	18	12	12	12	74	98	172

Mr. C. A. H. Lehmann obtained first place in the aggregate of fallow and crop. In this entry the fallow had been broken up in April, scarified in August and October when it was also harrowed, and the crop sown early in June with 70 lb. of seed and 72 lb. of superphosphate per acre.

Mr. N. L. Harders, with his No. 1 entry, showed the crop which received the highest number of points. Sown on winter fallow at the end of May, despite very heavy seeding rates, namely 110 lb. per acre of both seed and superphosphate, the crop had filled well but showed considerable more disease than desirable.

SECTION 4.

This section was included in 1938 to permit district crops grown on fallow which had not been judged in the preceding year to be eligible to compete for the champion crop of the Wimmera. Only two additional entries were received and that submitted by Mr. A. H. Pietsch was awarded the highest points in the whole of the competition and automatically competed in the championship. The variety shown was Ghurka and the land had been winter fallowed with a plough in July, harrowed twice and scarified in August, scarified in September, October, January, March, and May, and with each of the last two workings light harrows were used. The crop was combined in early in June, the area being harrowed nine days later. Seventy pounds of both seed and superphosphate were sown. The crop was fed off heavily in August but had made a good recovery, and, although somewhat uneven, showed very little disease or weeds. Mr. H. E. Holland's crop in this section was of Free Gallipoli and although promising earlier in the year the wheat was badly "tipped" owing to the dry conditions.

SECTION 3.—BEST 50 ACRES OF MALLEE FRINGE FALLOW 1937, AND CROP THEREON 1938.

Competitor.	Variety.	Yield.	Purity and Type.	Absence of—		Evenness.	Crop Total 1938.	Fallow Total 1937.	Aggregate.
				Weeds.	Disease.				
Maximum Points		**35**	**20**	**15**	**15**	**15**	**100**	**100**	**200**
C. A. H. Lehmann	Dundee	15	19	13	13	13	73	95	168
N. L. Harders, No. 1	Free Gallipoli	18	19	14	11	13	75	92	167
N. L. Harders, No. 2	Ghurka	14	18	14	14	12	72	95	167
H. A. Lehmann	Dundee	13	19	14	12	12	70	97	167
N. L. Harders, No. 3	Ghurka	14	18	14	14	12	72	95	167
T. J. Elsom	Free Gallipoli	10	18	14	13	12	67	86	153

The Fallows.

The fallows shown were generally of a high order considering that the season was not favorable to the production of the best exhibits. The importance of weed control and early preparation of the land appears to be fully recognized. All entries, exclusive of those on Mallee land, received their initial working not later than May.

The results of cultivation trials at Longerenong College indicate that over a long period of years very small differences in yield can be expected between summer and winter fallows. The advantages of the former lie in the fact that a better distribution of the farm work is obtained and the whole of the area to be fallowed receives its first working probably not later than July. The reduced yield resulting from late fallow has been very marked in the tests at Longerenong College, where over an eleven-year period land ploughed in October has yielded 10.2 bushels per acre below that for normal winter fallow ploughed in July. Not once over this period has the late fallow outyielded the normal winter fallow. The above trials also demonstrate the advantages of adequate cultivation and the results show that the use of sheep alone during the spring and summer months is not sufficient preparation for strong Wimmera land.

On the lighter Mallee land, however, summer fallowing and too frequent cultivation tend to create a very fine tilth and trouble may be experienced with soil drift. Excessive use of the harrows also aggravates this condition.

Section 5.

Mr. V. H. Harders' No. 2 fallow entry consisted of red and grey loam over a heavy clay subsoil. It had a fairly deep mulch which was evenly cloddy on the surface and had been left in a deeply ridged condition. It was considered that the moisture conserved in the subsoil and close to the seed bed, although low, was the highest in this section. Despite the fact that the only workings the fallow had received were a scarifying in June and in mid-August, a satisfactory control of weeds had been obtained, aided by the judicious use of sheep.

Section 5.—50 Acres Mallee Land Fallow.

Competitor.	Moisture.	Mulch.	Absence of Weeds.	Cultivation and Seed Bed.	Total.
Maximum Points	**25**	**25**	**25**	**25**	**100**
V. H. Harders, No. 2 ..	21	24	24	23	92
V. H. Harders, No. 1 ..	20	24	24	22	90
E. F. Jensz, No. 2	19	23	24	23	89
E. F. Jensz, No. 1	18	24	24	22	88

Section 6.—50 Acres of Fallow Land other than Mallee or Mallee Fringe Land.

Competitor.	Moisture.	Mulch.	Absence of Weeds.	Cultivation and Seed Bed.	Total.
Maximum Points ..	**25**	**25**	**25**	**25**	**100**
M. K. Fechner, No. 1 ..	20	24	24½	24	92½
A. H. Pietsch	20	24	24	24	92
M. K. Fechner, No. 2 ..	19	24	25	23	91
Westendorf Bros., No. 1 ..	20	23	24½	23	90½
Westendorf Bros., No. 2 ..	20	22	24½	22	88½
M. K. Fechner, No. 3 ..	18	23	24½	23	88½
S. E. Jorgenson, No. 2 ..	18	23	24½	23	88½
H. E. Holland, No. 1 ..	19½	22	24	23	88½
S. E. Jorgenson, No. 1 ..	18	22½	24½	23	88
T. Ingleton	19	21	25	23	88
A. H. Walsgott ..	19	22	25	22	88
H. E. Holland, No. 2 ..	19½	22	23½	22½	87½
T. E. Moller	17½	22½	24	22½	86½

Section 7.—50 Acres Fallow on Mallee Fringe Land.

Competitor.	Moisture.	Mulch.	Absence of Weeds.	Cultivation and Seed Bed.	Total.
Maximum Points ..	**25**	**25**	**25**	**25**	**100**
N. L. Harders, No. 1 ..	18½	23	25	23½	90
N. L. Harders, No. 2 ..	17½	22	24	22½	86
H. A. Lehmann ..	19	21½	23½	22	86
C. A. H. Lehmann, No. 1	17	23	23	23	86
C. A. H. Lehmann, No. 2	17	23	23	23	86
T. J. Elsom	18	21½	23½	22	85

Mr. M. K. Fechner had used the following cultivations in preparing his land:—Disked 3½ inches deep in February, and scarified in May, July, and August. It was harrowed early in November and sheeped as necessary.

In section 7, Mr. N. L. Harders was successful in winning first and equal second places.

Both entries had been scarified in May and again in July, harrowed in August and spring-toothed in September. The No. 1 entry had been worked under better conditions as regards soil moisture and was naturally a cleaner area.

Fertility Trends of Victorian Soils as Affected by Certain Rotational Systems

By H. C. Forster, M.Ag.Sc., Ph.D., Senior Cereal Research Officer, Department of Agriculture, Victoria.

A Resume of a Paper read to the Canberra Meeting of the Australian and New Zealand Association for the Advancement of Science, January, 1939.

IT has been evident from the very commencement of the meetings of this Congress that the question of soil fertility is of paramount importance to agriculturists. Various speakers have traced the development of farming in other countries, and have shown that the initial stages have been characterized by the use of exploitative types of continuous cropping which, though yielding immediate profitable cash returns, have tended in time to impoverish the soil and reduce crop yields. Thus the initial stage has been followed by a period in which returns have been unprofitable and cropping has become less important in the agriculture of the community. Later, with the adoption of more intensive farming methods, better rotations of crops and the carrying of greater numbers of live stock, the third stage has resulted in a more stable type of agriculture, in which fertility of the soil is not only maintained but also frequently has been considerably improved.

Loss of yield is not the only danger resulting from bad farming. Sir John Russell, in his discussion on erosion, instanced the harmful effects which have followed the use of exploitative methods in American agriculture. Because of the loss of organic matter from the soil and the wholesale destruction of the natural cover, the soil texture has been affected deleteriously, and this in turn has resulted in the disastrous loss of the complete surface horizon of the soil in many areas by wind erosion.

We in Australia has recognized the possible dangers which may follow the use of continuous cropping by farmers in this land.* General observations have been made that certain paddocks have tended to become "worked out," and the better farmers have appreciated the value of letting certain of their paddocks go out to grazing. Until recently, however, no detailed data of reduced yields have been put forward to support the evidence of possible loss of fertility, and consequently the full value has not been attached to the dangers which may accompany the use of exploitative methods of farming.

In order to check the effects of various rotational systems on the fertility of our Victorian soils, the Department of Agriculture laid down about 1914 a series of permanent trials in which some ten to fifteen different rotations were tested at three widely separated centres in this State. This paper presents the results to date of a study of the trend of the yields since the experiments were started.

The trials in question were laid down by the Department of Agriculture at three widely separated centres in Victoria about 1913-14. Consecutive yields are available therefore for about twenty years. Modelled on the Rothamsted trials, these tests consisted of a series of single plots sown to some ten to fifteen different rotations, ranging from continuously sown cereals, through the more normal systems of wheat-fallow or wheat-oats-fallow, to the more complex rotations including pasture, peas, &c.

The previous history, together with a brief description of the soil and climatological conditions, is as follows:—

Werribee.—Situated in the central district near Melbourne, with a rainfall of 19 inches on an alluvial soil derived from the basalt of the surrounding district. The previous history indicates that the area probably had been cropped for some 20 to 30 years previously.

Rutherglen.—Situated in the north-east, bordering on the foot-hills of the Dividing Range. Rainfall rather heavier at 22 to 23 inches, and favouring the rapid development of pasture. The soil type is a greyish-red buckshot silty loam. The area had been ploughed from grass and timber about 1912, just prior to the initiation of the trial.

* A. R. Callaghan. "Recovery of Wheat Prices and Some Agricultural Reflections thereon." J. Ag. S.A. 40. July, 1937.

Longerenong.—Near Horsham in the Wimmera. Rainfall 15 to 16 inches, and soil type typical grey self-mulching loam. The previous history indicates that this area had been worked only spasmodically prior to the initiation of the trials in 1917.

It is intended in this paper to present first the yields of the wheat-fallow and oat-fallow rotations, since these are typical of one type of continuous cropping. In the second part of the paper, a study of the effect of other rotations as compared to this basic type will be presented.

Because of the fact that the results of the trials are those from single plots and are therefore subject to considerable fluctuation, four-year moving averages* have been used in the study of the yield trends. For certain of the localities, Werribee and Longerenong, it was apparent that the yield trend was largely obscured by the major fluctuations caused by the variable seasonal conditions. Fig. 1 shows the actual yields of wheat and oats together with the average May to November and April to October rainfall in the case of Werribee. In view of the high correlation existing between these two factors of yield and rainfall in the growing season, it was possible to adjust for rainfall† so that the time trends might be made more significant and apparent. This adjustment has been applied accordingly in the case of Werribee and Longerenong, and Figs. 2 and 3 show the trends for these two stations. In the case of Rutherglen (Fig. 4) no such relationship exists and the actual yields were used in determining the trends.

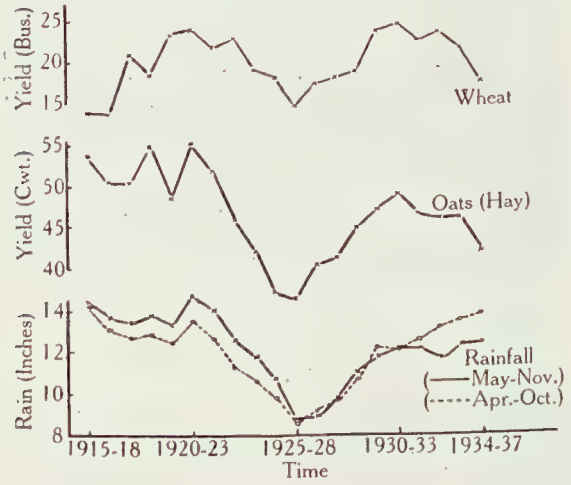


Fig. 1.—Comparison of rainfall with wheat and oat yields of Crop-Fallow rotations at Werribee.

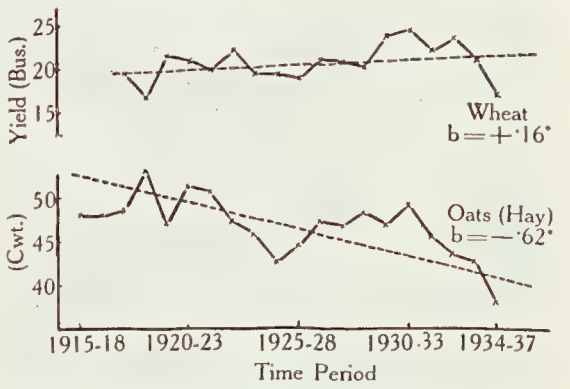


Fig. 2.—Trend of wheat and oat yields from Crop-Fallow rotations at Werribee after eliminating effect of rainfall.

The average trends in each case are represented by the dotted lines, the slope of the line being indicated by the figure following "*b*" immediately to the right of the line, a "+" indicating an increase, while a "—" indicates a fall in yield since the commencement of the trial. Thus in Fig. 2 for wheat, $b = +.16$, indicating an increase of .16 bushels per acre per year.

Figs. 2, 3, and 4 show that in the case of the plots under wheat-fallow, while the yield at Werribee is increasing slightly, the yields at both Longerenong and Rutherglen are just maintaining themselves. In the case of the oat crops, all three stations are showing a decided trend downwards, the fall in yield at Longerenong and Werribee being at the rate

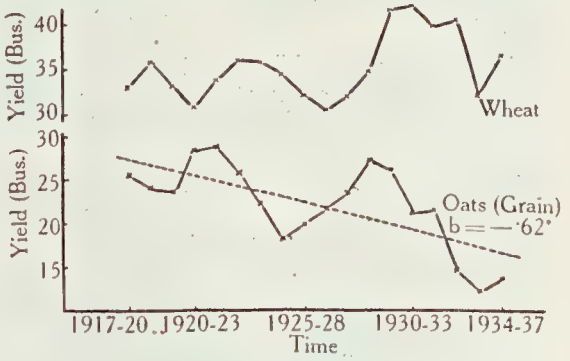


Fig. 3.—Trend of yields of wheat on fallow and oats on stubble at Longerenong after eliminating effect of rainfall.

* Yields were obtained for the periods 1917–20, 1918–21, 1919–22, &c., omitting the first year of the period and including one additional year for each new average.

† The method of partial regression has been used.

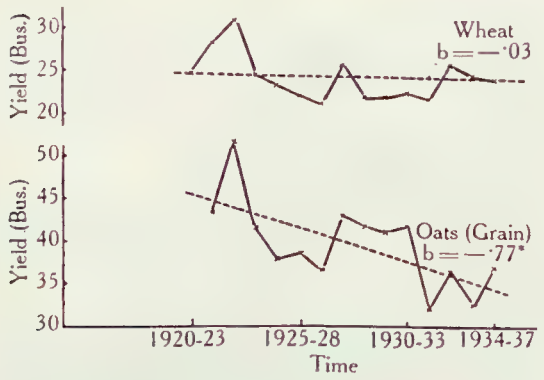


Fig. 4.—Trend of wheat and oat yields since 1920 from Crop-Fallow rotations at Rutherglen.

of approximately 12 bushels in the last eighteen years, while at Rutherglen, the drop has been at the rate of ¾ bushel per acre per year. It seems possible that in the case of wheat, the increased yields which would have resulted from the use of new varieties, increased amounts of superphosphate, and better methods of cultivation adopted since the trials started have just balanced an actual drop in fertility. Alternatively, it may be that oats are more susceptible than wheat to this decline in fertility.

It is probable then that a given paddock cropped continuously to wheat-fallow for fifteen years or more will show an appreciable decline in fertility by the end of that period.

Since cropping methods of this nature cannot be said to be general, it becomes important to know how other types of rotations affect the fertility of the soil. A comparison of the yields of the wheat-fallow plots with those of other rotations has indicated several important points.

Fig. 5 shows the difference in yield between the wheat plots in a wheat-oats-fallow rotation compared with the wheat-fallow rotation. It

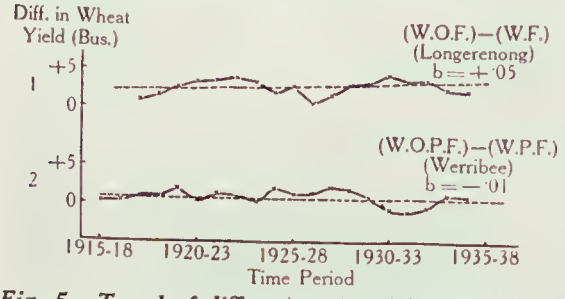


Fig. 5.—Trend of differences in yield of wheat when oats are included in the rotation.

is not the actual difference at any one time which is important at the moment, but the trend of those differences from year to year. Only two comparisons could be obtained, but both these indicated that the addition of a further cereal to the basic rotation neither increased nor decreased the trend of the yields. **Wheat-oat-fallow rotations therefore are also likely to decrease the fertility of the soil if continued for a number of years on the same land.**

Of all the rotations included in the trials, the only ones to show any improvement in trend of fertility were those which included some form of grazing. Fig. 6 serves to demonstrate this point with data from each of the stations. At Rutherglen where a one-year pasture provides fair grazing in the rotation wheat-oats-pasture-fallow, the comparative increase in the wheat yield has amounted to about 6 bushels during the eighteen years since the trial commenced. At Werribee and Longerenong, where a one-year's "ley" does

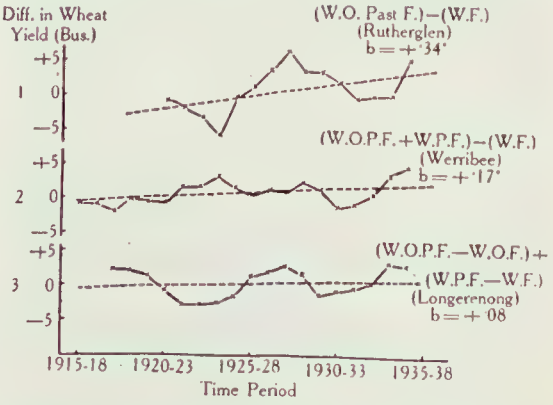


Fig. 6.—Trend of differences in yield of wheat when pasture is included in the rotation.

not provide as much grazing, the increase in yield of the subsequent wheat crop has been lower at 3 and 2 bushels per acre respectively. Other trials which have been conducted at Rutherglen recently support this gain in fertility when pasture is ploughed in, and have indicated that with longer periods of pasture in the rotation, greater improvement in fertility may be expected.

Summarizing the position then, it is evident that under rotational systems such as wheat-fallow or wheat-oats-fallow, the yields of the wheat crops are barely maintaining themselves, despite the introduction of higher yielding varieties, greater applications of manure and improved methods of

cultivation. Oat yields in similar rotations are showing a material decline in yield at the rate of approximately ⅔ bushel per acre per year.

In spite of close observation, there is little evidence to date to indicate that either disease or weeds are more prevalent than formerly. Thus, we are forced to the conclusion that the fertility of the soil is declining under these rotational systems. It is evident that the exploitative stage of Victorian agriculture is over.

It may be that the deficiency in fertility is connected with a loss of some necessary mineral element from the soil, although the likelihood that this is the case in the three widely separated districts used in this survey is very remote. The more probable likelihood is that the fertility is bound up with the organic matter of the soil, and this is supported by the responses obtained where the grazing animal has been included in the rotation.

Although it is apparent from the economic point of view that it may be desirable in years of high wheat prices to concentrate on more wheat, it must be recognized that the continued practice of these rotations will tend to impoverish the soil. In times such as the present, when wheat prices are low, it is advisable from the economic as well as the fertility angle to include as much grazing as possible in order to make good the loss in fertility occasioned by former years of intensive cropping.

In those wheat-growing districts where rainfall is plentiful and pasture is easily and quickly established, the problem of loss of fertility presents little difficulty, since mixed farming is frequent and stock are generally carried. In districts of lighter rainfall where quick pastures are not easily obtained, the Department is at present concentrating on the development of the most suitable grasses and clovers. Until these are tested, the growing of oats for grazing appears to offer the best method available at the moment for incorporating grazing on the ordinary cereal farm.

Recent experiments at Werribee indicate that the grazing of oats is much more efficient than the grazing of ordinary "ley" land as far as regaining fertility is concerned. For those farmers whose properties are sufficiently large, the practice of spelling portions of their properties for periods of five or six years at a time preferably after a sowing of grasses or clovers with the last cereal crop, should counteract the possible damage resulting from a period of continuous cropping.

Licensed Skin Buyers

(*Supplementary List*)

Sheep Owners Protection Act

Following is a list of persons licensed under the Sheep Owners Protection Act to buy raw sheep skins. The licences have effect until the 31st December, 1938.

Licence No.	Name.	Address.
766	Anderson, R. ..	Meeniyan
775	Archibald Bros. ..	Boulah
772	Armstrong, F. ..	56 Cutter-street, Burnley
764	Bourke, R. T. ..	Koondrook
774	Butler, R. A. ..	195 Queen-street, Bendigo
752	Byerley, H. M. ..	c/o C. S. McLeod, 9 Nyowie-street, Regent
758	Causer, H. B. ..	Wal Wal
761	Delfendahl, O. ..	Orbost
765	Douglas, D. W. ..	Stuart Mill
777	Harper, W. ..	Alberton
755	Henderson, A. H. F.	Barham, N.S.W.
769	Howlett, A. E. ..	Casterton
762	Janson, C. H. ..	Rochester
756	Jobe, C. E. ..	Minyip
768	Johnstone, W. A. ..	Casterton
760	Krew, Eli ..	278 Rathdown-street, North Carlton
754	McClintock, A. E. ..	Digby
759	McKee, J. R. ..	48 Sackville-street, Kew
776	McMillan, R. H. ..	Maffra
773	Patterson, D. D. ..	Nhill
771	Pincini, J. ..	Mirboo North
753	Rice, W. ..	Bombala, N.S.W.
763	Rutter, J. ..	3 Johnson-street, Stawell
757	Schneider, E. V. and Son	Sea Lake
770	Timms, N. ..	Minyip
767	Wheeler, F. E. ..	Tallangatta

Clovers and Allied Species

Identification Key and Detailed Descriptions

By A. Morgan, B.Agr.Sc., Irrigation Field Officer

In the February issue of this Journal the method of approach in the identification of a clover specimen was discussed and the distinguishing characters between the various groups of clovers were set out. The following article, which includes a key for the accurate determination of the identity of specimens together with a detailed description of each, should be read in conjunction with the February Journal, as many references are made to figures, pages, etc., which appeared in that issue.

IDENTIFICATION KEY.

In the following key which is used in the identification of clovers and allied species, there is, at each step, a choice between two characters. Decide which is present on the specimen, and note the number at the *end* of the line describing that character. Then proceed to the same number at the *beginning* of a line. Repeat this process until the name of the plant is arrived at, after which a careful examination of the specimen should be made in conjunction with the detailed description of the species given later in this article. The page on which this description will be found is indicated in each case in the key.

1. Plant spreads by means of creeping stems which send down roots into the soil from points near the junctions of the leaves with the stem .. .. See 2
   Plant does not spread in this manner .. See 3
2. Veins of leaflet closely-spaced, much branched, curved (see Fig. 4); *or* Base of each flower in head clothed with shining white hairs; *or* Flowers in head becoming bladdery in maturing heads (see Fig. 6)
   STRAWBERRY CLOVER (p. 137)
   Veins of leaflet wide-spaced, little-branched, straight (see Fig. 4); *or* Base of each flower in head devoid of hairs; *or* Flowers in head turning down as they mature (see Fig. 6)
   WHITE CLOVER (p. 136)
3. Stalk of middle leaflet longer than those of side leaflets (see Fig. 7) (MEDICKS) 20
   Stalks of leaflets all the same length (TRUE CLOVERS) 4

True Clovers (*including Fenugreeks*).

4. Erect plants 5
   Prostrate plants 11
5. Stipule (see Fig. 11) is blunt, rounded, and leafy CRIMSON CLOVER (p. 138)
   Stipule pointed, not leafy at free end .. 6
6. Plant not showing hairiness on any portion of stem or leaf .. .. ALSIKE CLOVER (p. 140)
   Plant showing hairiness of some part of stem or leaf 7
7. Stipule abruptly narrowed and ending in a long fine point (see Fig. 11) 8
   Stipule gradually tapered to a point .. 9
8. Stem zig-zag in arrangement ZIG-ZAG CLOVER (p. 139)
   Stem not zig-zag in arrangement RED CLOVER (p. 137)
9. Leaflets several times longer than wide
   Flowers cream-coloured or yellowish BERSEEM CLOVER (p. 139)
   Flowers not cream-coloured or yellowish .. 10
10. Plant with long hard bristly head NARROW-LEAVED CLOVER (p. 139)
    Plant with short, soft, reddish, hairy head HARE'S-FOOT CLOVER (p. 139)
11. Plant hairy on leaves or stems 12
    Plant not hairy on leaves or stems .. 14
12. Leaflets pointed; flowers in heads .. 13
    Leaflets rounded (and notched in some cases) at free end; flowers not in heads SUBTERRANEAN CLOVER (p.)
    Note.—Under grazing it is possible for Red Clover to be prostrate, and in some cases the leaflets are similar to those of Subterranean Clover. Examine the stipules and refer to Fig. 11, and the text on page 140.
13. Flowers white .. .. ROUGH CLOVER (p. 141)
    Flowers pale yellow SWEET FENUGREEK (p. 144)
    Flowers pink .. KNOTTED CLOVER (p. 141)
14. Not more than five flowers (average) in each head 15
    More than five flowers in each head .. 16
15. Flowers yellow .. SWEET FENUGREEK (p. 144)
    Flowers pinkish BIRD'S-FOOT FENUGREEK (p. 144)
16. Heads soft and woolly 17
    Heads not soft and woolly 18
17. Flowers pale pink WOOLLY CLOVER (p. 142)
    Flowers dark-pink to violet colour REVERSED CLOVER (p. 142)
18. Flower-heads on stalks; flowers turn down on withering NODDING (DROOPING) CLOVER (p. 142)
    Flower-heads not stalked, forming a hard greenish ball 19
19. Flowers white .. SUFFOCATED CLOVER (p. 143)
    Flowers pink .. CLUSTER CLOVER (p. 142)

Medicks (*includes Melilots, Hop Clover and Suckling Clover*).

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Fig 22.—White Clover (Trifolium repens).
A.—Plant. B.—Flower (enlarged). C.—Fruiting head (slightly enlarged).
[*West Aust. Dept. of Agric.*]

Bird's-foot Trefoils
(Lotus species).

Note.—These are very variable plants.

44. Flowers purple-red; *or* Pod with four wings or ribs — WINGED PEA (p. 151)
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DETAILED DESCRIPTIONS.

The True Clovers
(Trifolium Species.)

1. WHITE CLOVER (*Trifolium repens* L.).—Perennial.

Other names.—White Dutch Clover, White Trefoil, White Honeysuckle, Shamrock, Quillet.

Stem hairless, prostrate, rooting (see Fig. 3).

Leaf marking variable (black, brown, white or purple as crescents, bands, or flecks) or none (see Fig. 1).

Leaflet.—Shape variable (see Fig. 2), stalks equal, margin toothed, not hairy, veins straight and not much branching (see Fig. 4).

Flowers white to pinkish, small, numerous (30 to 40) in head, stalked in head. Calyx without hairs, ten-nerved teeth, long, sharp and equal (see Fig. 5). Flower-head globular, stalk longer than that of leaf, rather loose owing to stalked flowers, which turn downward as they mature (see Fig. 6).

Stipule pointed, not hairy, not toothed.

Seed-pod oblong, 1 to 7 seeded, slightly constricted between the seeds, splits open along one edge when ripe.

Fig. 23.—Strawberry Clover (Trifolium fragiferum).
A.—Plant. B.—Leaf. C.—Leaflet. D.—Flower head. E.—Single flower. F. Fruiting head. G. Pod and seed.

[*West Aust. Dept. of Agric.*]

Seed lemon-yellow, occasionally brownish or reddish, small (average 0.68 gm. per thousand).

According to Miss Erith, in her monograph on white clover, the various strains now on the Victorian market would be members of *Trifolium repens* L. var. *sylvestre* race *hollandicum*, with the exception of Lodino Clover (Lodi clover, Italian White, Mammoth White, Giant White) which is placed in race *giganteum*.

The strains used for permanent pasture sowings are White Dutch, New Zealand certified wild

white, Victorian certified irrigation wild white, and Kentish wild white. Of these, the certified strains mentioned are superior in productivity for pasture in good rainfall districts and under irrigation. Details of tests of these strains will be found in a pamphlet obtainable free on application to the Director, Department of Agriculture, Melbourne, C.2, describing work at Burnley.

2. Strawberry Clover (*Trifolium fragiferum* L.).—Perennial.

Other names.—Perennial Strawberry Clover (see Annual Strawberry Clover, No. 16).

Stem prostrate, hairless, rooting (as in White Clover, Fig. 3).

Leaf marking variable (black, brown, or white as crescents or flecks) or none.

Leaflet.—Shape rather narrow, elliptic or pointed-oval. Stalks equal. Margin toothed or not toothed. Hairs variable—may be a few along veins on under surface, on leaflet stalks, or down upper part of leafstalk. Veining arched and much branched (see Fig. 4).

Flowers nearly stalkless in a round head, pinkish, small, silky-hairy on the calyx. Stalk of flower-head usually longer than leafstalks. Calyx inflated on maturity (see Fig. 6).

Stipule pointed, not hairy, not toothed, veining prominent.

Strawberry Clover is adapted to withstand wetter and drier conditions than White Clover, but in general is less productive. Seed is dear, and except where conditions are unfavorable for the development of White Clover, Strawberry Clover is added to seeds mixtures in small amounts only (as an example, 4 oz. per acre is added to the standard mixture for irrigated permanent pastures). A more productive strain occurs spontaneously at Swan Hill and elsewhere in the north, and may be propagated by roots, while a strain from Palestine has been under trial at Burnley. Shearman's, a variety first noted in New South Wales, is superior to typical Strawberry Clover but less drought-resistant. Strawberry Clover is more tolerant of salty ground than is White Clover, and has been valuable, as a volunteer species, in reclamation at Cohuna and elsewhere. Some very good pastures in which it is dominant occur in the more open parts of the Western District "stony rises," also in Gippsland valleys and on slightly saline coastal areas.

3. Red Clover (*Trifolium pratense* L.).—Perennial.

Other names.—Cowgrass, Perennial Red Clover, Chilian Clover, Purple Clover, Giant Clover, Sapling Clover, Meadow Clover, Pea-Vine Clover.

Stem erect, hairy.

Fig. 24.—Crimson Clover (Trifolium incarnatum).
A.—Portion of plant. B.—Leaf. C.—Flower. D.—Fruiting calyx. E.—Seeds.

[*West Aust. Dept. of Agric.*]

Leaf marking variable (none or white crescentic). Leaflet: Shape very variable (see Fig. 13); stalks equal; no teeth on margin, or very few; conspicuously hairy; veining much branched (see Fig. 13).

Flowers purplish (rare plants with white flowers), small, stalked, numerous, in large rounded stalkless heads at ends of stems. Calyx hairy, lowest tooth much the longest (see Fig. 5).

Stipule composed of broad fixed portion, and an abruptly-narrowed free portion surmounted by a long fine hairy point. Conspicuously veined (see Fig. 11).

Seed-pod a one-seeded capsule, top portion splitting off when ripe (a *pyxidium*) (see Fig. 12).

Seed oval, with nose-like projection on one side. Weight averages nearly 2 gm. per thousand.

Cowgrass has been a valuable high-production species in pastures in dairying districts and as a temporary species in permanent mixtures for irrigation. As a persistent volunteer, it shows best development in association with cocksfoot in hilly sections of the Warragul district. Its main disadvantage is a tendency to cause bloat where grazing by dairy cows is not regulated. There are four groups into which the numerous strains may be classified: Broad red, late red, extra late red, and wild red. Broad red is early flowering, and suitable for temporary pastures. For permanent pasture mixtures, the extra late red is best, the New Zealand Montgomery red being recommended. This strain is certified by the New Zealand authorities. Wild red clover is very variable, and its persistency is offset by its low production.

Fig. 25.—Hare's-foot Clover (Trifolium arvense).

[*Michigan Agric. Coll. Bull. 267.*]

4. Crimson Clover (*Trifolium incarnatum* L.).—Annual.

Other names.—Scarlet Clover, French Clover, Italian Clover, German Clover, Carnation Clover.

Stem erect, hairy.

Leaf.—No markings. Shape variable [from broad and notched, like Subterranean Clover (see Fig. 14c), to the shape of red clover (see Fig. 13).] Leaflet stalks equal. Leaf margin toothed at summit. Conspicuously hairy. Venation not much branched.

Flowers crimson, small, arranged in solitary oblong or cylindrical large heads on long stalks at ends of stems. Calyx very hairy; teeth almost equal, and stiff and spreading on mature flowers.

Stipule very distinctive; free part rounded, wavy, leafy; not pointed as in all other clovers in Victoria (see Fig. 11).

Seed rich reddish-yellow when fresh, large, almost perfectly oval, weighs about 3½ gm. per thousand. A white-flowered variety has pale cream-coloured seeds.

Crimson Clover is occasionally grown in pure stands for hay or pasturage but is not used in permanent pasture mixtures. It requires good rainfall. It may be sown with Italian rye-grass for winter and spring feed, using about 3 lb. clover and 15 lb. rye-grass per acre, sown in

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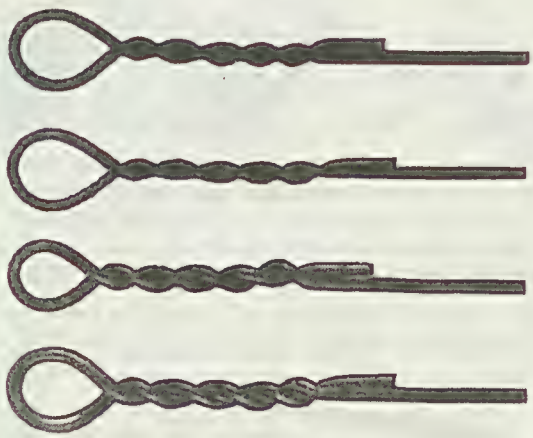

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5. Hare's-foot Clover (*Trifolium arvense* L.).—Annual.

Stem erect, slender, hairy, branching.
Leaf markings absent. Shape of leaflet long and narrow. Leaflet stalks equal. Leaf-margin faintly toothed near free end, or not toothed. Hairy. Venation rather straight, not much branched.
Flowers pink, small, very short-stalked, numerous in a silky oblong or cylindrical long-stalked head with a bluish tinge; silkiness due to hairiness of long fine calyx teeth.

Fig 26.—Berseem Clover (Trifolium alexandrinum).

A.—Flowering stem. B.—Leaf. C.—Flower head. D.—Flower.

[*West Aust. Dept. of Agric.*]

Stipule narrow, long-pointed, reddish.
Seed-pod very small, one-seeded. Seed yellowish-green.

A common, weedy species, the value of Hare's-foot Clover is slight except in unimproved pastures under indifferent rainfall. Disadvantages are short life in leafy condition and low leaf to stem ratio, also small amount of growth. Its production and quality are improved by topdressing.

6. Narrow-leaved Clover (*Trifolium angustifolium* L.).—Annual.

Stem erect, stiff, hairy.
Leaf markings absent; very long and narrow leaflets; leaflet stalks equal; margin not toothed; conspicuously hairy; venation straight, unbranched.
Flowers pink, small, very short-stalked, numerous in long cylindrical short-stalked solitary heads at the ends of the stems. Calyx teeth hairy, rigid, spreading. Head rough owing to calyx teeth.
Stipule long, narrow, free part consisting of a long awl-shaped point, veins prominent and green.
Seed-pod enclosed in persistent calyx with closed throat at maturity.

Narrow-leaved Clover is a common weedy species, without the redeeming features of Hare's-foot Clover (No. 5).

7. Berseem (*Trifolium alexandrinum* L.).—Annual.

Other name.—Egyptian Clover.
Stem ascending, not hairy at base, hairy towards top, sometimes shows prominent transverse rings.
Leaf markings absent; leaflet of variable shape (oblong-elliptical to rounded); leaflet stalks equal; margin toothed towards free end; hairy on both surfaces; a small point (mucro) projecting from free end of leaflet (see Fig. 15).
Flowers cream or pale-yellow, small, stalked, numerous in a stalked head which is ovate at first, later elliptical; heads solitary at ends of stems, up to 1½ inches long on the average. Calyx teeth almost equal, hairy.
Stipule with a long tapering hairy free portion.
Seed-pod one- (rarely two-) seeded; seed egg-shaped, yellow to reddish-brown, about one-twelfth of an inch long.

Of the five main varieties of Berseem Clover developed in Egypt, Miskawi (Muscowi) has been found to be the most useful one here. It is grown for winter green feed, for hay, or to restore the nitrogen level of the soil, and is sown at rates from 10 to 20 lb. per acre. It is not a plant for inclusion in permanent pasture mixtures, although it has proved particularly productive as a pure stand under irrigation.

8. Zig-zag Clover (*Trifolium medium* L.).—Perennial.

Other names.—Mammoth Clover, Marlgrass, Meadow Clover.
Stem ascending, straggling, bent at every node, hairy.

Leaf leaflets oblong, narrower and longer than red clover; leaflet stalks equal; margin with few very small teeth or none; hairy.

Flowers purple (darker than red clover), small, stalked, numerous in large showy hairy-stalked heads at ends of stems. Calyx teeth narrow and tapering, hairy, one long as in red clover (see Fig. 5).

Stipule large, veined, tapering to a point.

Zig-zag Clover is not yet recorded naturalized in Victoria, but is included because of possible introduction later, via South Australia. It has some value as a pasture plant, but is not exploited except as a volunteer, since Red Clover of superior quality is always available for use in any situations where Zig-zag Clover would be suitable.

9. Alsike Clover (*Trifolium hybridum* L.).—Perennial.

Other names.— Swedish Clover, Alsace Clover, Hybrid Clover, Alsike.

Stem erect, hairless.

Leaf markings absent; leaflets intermediate in shape between White and Strawberry Clovers (see Fig. 4), very similar to those of Swan Hill Strawberry Clover on occasion; leaflet stalks equal; margin toothed; not hairy; veins close, arched, much branched.

Flowers pale-pink or white, small, stalked, numerous in large rounded stalked heads at ends of stems, turned downward at maturity (see White Clover, Fig. 6); calyx hairless, five-nerved (compare White Clover, ten-nerved). Some heads formed at junction of leaf-stalks with stems.

Stipule with long tapering pointed free portion with clear veining (see Fig. 11).

Seed-pod with one to three seeds, does not split open when ripe. Seed heart-shaped, dark to pale-greenish when fresh, weighs about 0.7 gm. per thousand.

Alsike Clover is usefully employed in permanent pasture mixtures as a short-lived perennial. Its usual life is from four to five years, but, under conditions too damp for cow-grass (No. 3), it may persist for a longer period. It is inclined to be unpalatable in comparison with other perennial clovers. It is a true species, not a hybrid between White Clover and Red Clover. In a mixture, for good rainfall or irrigation, sow about 2 lb. per acre.

10. Subterranean Clover (*Trifolium subterraneum* L.).—Annual.

Stem prostrate, hairy.

Leaf marking variable (white or black crescentic or flecks) or none. Leaflets rounded, broader at free end, notched. Leaflet stalks equal. Margin may be toothed slightly towards free end. Hairs on under surface, may be few or absent on upper surface. Venation much-branched (see Fig. 14).

Flowers creamy-white or pinkish, small, often with bright-red calyx. Three or more fertile flowers, and sterile flowers, in group on stalk arising from junction of leaf-stalk with stem. All reflexed when matured, so that fertile flowers surrounded by calyx teeth, forming "burr"; stalk elongates and tends to bury the "burr."

Fig 27.—Alsike Clover (Trifolium hybridum).
A.—Habit. B.—Leaf. C.—Flower. D.—Pod. E.—Seeds.
[*West Aust. Dept. of Agric.*]

Stipule tapering, with inconspicuous veining, often reddish.

Seed-pod one-seeded, more than one pod in each "burr."

Subterranean is our most valuable clover in dry (but not low rainfall) districts, either sown with Wimmera rye-grass or in native pasture. In the good rainfall districts it is usually present with perennial rye-grass, &c., and can be greatly improved by top dressing. It is valuable in the irrigation areas, with Wimmera rye-grass, where facilities for watering permanent pasture are inadequate. It should be included in mixtures at the rate of about 3 lb. per acre; seldom is it sown as a pure stand. A large number of strains have been separated, and a full description of these, and methods of harvesting seed, &c., will be found in the pamphlet "Subterranean Clover." Owing to strain variations, the description given above can only be considered approximate. Surface sowing of this species in Danthonia (wallaby grass) swards under marginal conditions in regard to rainfall is a promising recent development, particularly because of low establishment costs.

11. KNOTTED CLOVER (*Trifolium striatum* L.).—Annual.

Stem prostrate to ascending, hairy.

Leaf markings absent. Leaflets egg-shaped or wedge-shaped at free end; leaflet stalks equal; margin faintly-toothed; conspicuously hairy.

Flowers pink, small, stalked, numerous in stalkless egg-shaped or oblong heads at ends of stems and in the angles of leaf-stalks. Calyx, hairy, ten-nerved, swollen at maturity; teeth almost equal, stiff, spreading, awl-shaped (see Fig. 5).

Stipule broad, abrupt taper to a fine point.

Knotted Clover is not sown, but where it occurs as a volunteer it provides feed of good quality, especially if regularly top dressed. It is found in association with Subterranean Clover in pastures in districts of good rainfall, in the damper places in dry districts, and occasionally in irrigated paddocks.

Fig 28.—Woolly Clover (Trifolium tomentosum).

A.—Plant. B.—Flowering and fruiting heads. C.—Two views of a flower. D.—Pod. E.—Seed.

[*West Aust. Dept. of Agric.*]

12. ROUGH CLOVER (*Trifolium scabrum* L.).—Annual.

Stem prostrate, hairy.

Leaf markings absent. Leaflets egg-shaped or wedge-shaped at free end; leaflet stalks equal; margin toothed; conspicuously hairy; veins arched towards margin.

Fig 29.—Cluster Clover (Trifolium glomeratum).

A.—Flowering branch. B.—Seeding branch. C.—Calyx. D.—Flower. E.—Clover seed. F.—Sorrel seed. G.—Sorrel seed with husk removed.

[*West Aust. Dept. of Agric.*]

Flowers white, small, stalked, numerous in small rounded stalkless heads in angles of leaves. Heads contracted towards base. Calyx hairy; teeth narrow, rigid, curved outward.

Rough Clover is classed as a weedy species, except in the drier pastures, where it is equivalent to annuals such as Suckling Clover (No. 19).

13. Woolly Clover (*Trifolium tomentosum* L.).—Annual.

Other names.—Woolly-headed Clover, Fluffy Clover.

Stem prostrate to ascending, hairs absent.

Leaf markings variable (white and brownish) or none. Leaflets egg-shaped or wedge-shaped at free end; leaflet stalks equal. Margin toothed. Hairs absent. Veins straight, very little branching, not prominent.

Flowers pinkish, small, almost stalkless, numerous in white or pinkish round shortly-stalked woolly heads in angles of leaf-stalks. Woolly appearance due to swelling of calyx of each flower into a globular netted bladder, similar to that of Strawberry Clover (see Fig. 6). Calyx hairy.

Stipule tapering.

Woolly Clover is discussed on page 59.

14. Cluster Clover (*Trifolium glomeratum* L.).—Annual.

Other names.—Ball Clover, Clustered Clover, Bush Clover, Native Trefoil, Smooth Round-headed Trefoil.

Stem prostrate, hairs absent.

Leaf marking variable (white or brownish crescentic) or none. Leaflets egg-shaped or wedge-shaped at free end or pointed. Leaflet stalks equal. Margin toothed. Hairs absent. Veins strong, straight, very little branching.

Flowers pale-pink to rose-red, small, stalkless, numerous in small round stalkless distant heads along the stem. Calyx hairless, ten-nerved; calyx teeth equal, recurved at maturity.

Stipule broad-triangular, long-pointed, with one or two small teeth or none.

Seed-pod enclosed, with one to two seeds. Seeds small (about 1½ million per lb.), light-yellow, almost globular, rough.

Notes on Cluster Clover appear on page 59.

15. Nodding Clover (*Trifolium cernuum* Brot.).—Annual.

Other names.—Drooping Clover, Drooping-flowered Clover, Gingin Clover (W.A.).

Stem prostrate, hollow, hairless.

Leaf markings absent. Leaflets egg-shaped or wedge-shaped at free end or pointed. Leaflet stalks equal. Margin toothed. Hairs absent. Veining strong.

Flowers pink, small, shortly stalked, numerous in small, globular, rather loose, stalked heads along the stems. Flowers finally turned downward as in White Clover (see Fig. 6A). Calyx hairless, teeth nearly equal.

Stipule gradually tapering, not toothed.

Seed light-yellow, very small.

Nodding Clover, first recorded naturalized in Victoria in 1903, under the name *Trifolium parviflorum*, is suitable for districts where the rainfall is not quite good enough for Subterranean Clover. Seed is obtainable in quantity.

16. Reversed Clover (*Trifolium resupinatum* L.) (*T. suaveolens*).—Annual.

Other names.—Reversed Trefoil, Persian Clover, Shaftal Clover, Annual Strawberry Clover.

Stem procumbent, hollow, hairless.

Leaf markings absent. Leaflets egg-shaped, wedge-shaped, or pointed at free end. Leaflet stalks equal. Margin toothed. Hairless. Veining strong.

Fig 30.—Nodding Clover (Trifolium cernuum).
A.—Portion of plant showing ascending habit. B.—Leaf. C.—Flowering head.
D.—Fruiting head. E.—Flower. F.—Fruiting calyx. G.—Seeds.
[*West Aust. Dept. of Agric.*]

Flowers pink to violet colour, small, in stalked heads. Stalks of heads often long. Heads globular, white, and woolly; at intervals along stems. Calyx expands at maturity into bladder with two conspicuous divergent teeth (Cf. Strawberry Clover, Fig. 6B).

17. SUFFOCATED CLOVER (*Trifolium suffocatum* L.)—Annual.

Other names.—Suffocated Trefoil.
Stem hairless, prostrate or ascending.
Leaf leaflets egg-shaped; stalks equal. Margin toothed. Hairless. All leaves on long stalks.
Flowers white, small, stalkless, petal shorter than the calyx, and, therefore, inconspicuous; grouped in tiny egg-shaped heads. Calyx teeth narrow and recurved.
Seed-pod two-seeded.

Suffocated Clover occurs in Shepparton district.

18. HOP CLOVER (*Trifolium procumbens* L.)—Annual.

Other names.—Hop trefoil, Low Hop Clover, Yellow Clover, Lesser Clover.
Stem erect, hairy or hairless.
Leaf markings absent. Leaflets egg-shaped to wedge-shaped. Stalk of middle leaflet the longest. Margin toothed. Hairy or hairless. Veins straight, practically unbranched (see Fig. 8).
Flowers yellow, one portion broad and furrowed; small, stalkless, numerous in rounded stalked heads set in angles of leaf-stalks. Calyx teeth unequal.
Stipule triangular, broad, pointed, not toothed.
Seed-pod one-seeded. Seed globular, yellow, very small.

Hop Clover occurs in pastures in the better rainfall districts, where it makes good growth in season, and provides good feed. It is not sown to any extent in Victoria. Occasional patches are seen in moist situations in dry districts.

19. SUCKLING CLOVER (*Trifolium dubium* Sibth), (*T. minus* Sm.), (*T. minus* Rel.).—Annual.

Other names.—Lesser Clover, Yellow Suckling Clover, Small Trefoil.
Stem slender, erect, hairy.
Leaf markings absent. Leaflets egg-shaped to wedge-shaped; middle leaflet stalk the longest. Margin toothed. Hairy. Veins straight, practically unbranched.
Flowers yellow, small, stalked, few in number in small heads on slender stalks and rising from leaf-stalk angles.
Stipule broad, tapering, not toothed.

Suckling Clover is commonly found in most pastures, except in very dry districts. It provides useful feed in early spring, but goes off quickly. The ratio of leaf to stem is not high.

Fig. 31.—Hop Clover (Trifolium procumbens).
A.—Plant. B.—Branch. C.—Flower head. D.—Flower. E.—Pod enclosed in flower, and seed.
[*West Aust. Dept. of Agric.*]

It is not sown to any extent in Victoria, but 2 or 3 lb. per acre may be used in mixtures on occasion.

20. FENUGREEK (*Trigonella ornithopodoides* D.C.).—Annual.

Other names.—Bird's-foot Fenugreek.
Stem prostrate, hairless.
Leaf markings absent, or faint white marking on each leaflet. Leaflets broad at free end and slightly notched. Margin toothed conspicuously towards free end. Leaflet stalks equal. Hairs absent. Veins straight, very little branching.
Flowers faint-pink, small, two or three in groups on stalks arising from leaf-stalk angles. Calyx teeth equal.
Stipule tapering, not toothed, veining distinct.
Seed-pod about eight-seeded, longer than withered flower-parts, compressed, curved (see Fig. 32).

This species of Fenugreek is commonly found in pastures in all but very dry districts, and usually is marked by its pale-green colour. It may be dominant in moist places in the more open section of the "Stony Rises" (Western District). Occasional in irrigated paddocks. Fair feed, but not a high producer.

21. SWEET FENUGREEK (*Trigonella suavissima* Sm.).—Annual.

Other names.—Darling Clover.
Stem prostrate or ascending, usually hairless.
Leaf leaflet heart-shaped or egg-shaped, less than ½ inch long. Leaflet stalks equal. Margin toothed. A few hairs present on under side. Fragrant.
Flowers yellow, small; four to eight in loose, very short-stalked clusters in angles of leaf-stalks. Calyx teeth equal.
Stipule with a few coarse teeth.
Seed-pod hairy, wrinkled, netted surface, curved; up to ¾ inch long.

Fig. 32.—Pods of Fenugreek.
[After *Ewart.*

Sweet Fenugreek is a native plant found only in northwest of Victoria, and rare there.

22. SPOTTED MEDICK (*Medicago arabica* All., *M. maculata* L.).—Annual.

Other names.—Spotted Trefoil, Southern Burr, Winter Burr, Spotted-leaf Burr.

Stem prostrate or ascending, four-angled, with a few hairs.

Leaf marking—usually a black-brown spot on each leaflet. Leaflets egg-shaped to wedge-shaped and notched at free end. Margin slightly toothed towards free end. No hairs on upper surface. Veins straight, little branching. Middle leaflet stalk the longest (see Fig. 7).

Flowers yellow, small; up to five in clusters on awned stalks arising in angles of leaf-stalks. (See Fig. 19A for position of awn.)

Stipule coarsely toothed (similar to Rough Medick, see Fig. 15).

Seed-pod a burr. Hairless, three to six close coils, spines slender curved, not hooked (see Fig. 33). Seed-pod stalk awned. Seed light-brownish yellow, kidney-shaped.

For notes on Spotted Medick, see page 61.

23. MEDICAGO LACINIATA.—Annual.

Stem prostrate or ascending, very few hairs or none.

Leaf markings absent. Leaflets rather narrow and long; middle leaflet stalk the longest. Margin broken by irregularly-arranged and large teeth; appears as if it has been eaten by insects. Veins straight, little branching. Hairs, a few on under-surface.

Fig. 33.—Seed pod of Spotted Medick.
[After *Ewart.*]

Flowers yellow, small, two or three in cluster on awned stalk longer than leaf. Calyx hairy, teeth equal.

Stipule coarsely toothed.

Seed-pod rather barrel-shaped, four to five coils, spines rather stiff and long. A burr with an awned stalk (Cf. Fig. 19A).

Medicago laciniata is not recorded naturalized in Victoria, but is found in New South Wales, and has been noted among plants grown here from commercial seed. It might perhaps be regarded as a variety of Rough Medick.

Fig. 34.—Suckling Clover (Trifolium dubium).
A.—Habit. B.—Flower head. C and D.—Single flowers. E.—Seeds.
[*West Aust. Dept. of Agric.*]

24. CALTROP MEDICK (*Medicago tribuloides* Desr.).—Annual.

Other names.—Barrel Clover.

Stem prostrate or ascending, hairy.

Leaf markings absent. Leaflets egg-shaped or wedge-shaped; middle leaflet stalk the longest. Margin coarsely toothed towards free end. Hairy on both surfaces, giving plant a whitish appearance.

Flowers yellow, small, one to three in cluster on awned stalk. Calyx teeth equal.

Seed-pod a burr. Barrel-shaped, four to five close coils. Spines conical, flattened to coils, not hooked. Seeds six to ten per burr. Seed-pod stalk awned.

Seed large, yellow, kidney-shaped.

Caltrop Medick is a good fodder in the drier districts. In South Australia it is now being sown to some extent. The burr is not as objectionable to wool growers as that of most of the other trefoils suitable to dry conditions (14 to 20 inch rainfall.)

25. SMALL BURR MEDICK (*Medicago minima* L.).—Annual.

Other names.—Woolly Burr Trefoil.

Stem prostrate, very hairy, whitish.

Leaf markings absent. Leaflets egg-shaped or wedge-shaped; middle leaflet stalk the longest. Margin toothed towards free end. Very hairy on both surfaces.
Flowers yellow, small, one to three in cluster on awned stalk no longer than leaf.
Stipule broad, no teeth or only a few small teeth at base.
Seed-pod a burr. Hairy, two to five coils, partly separated. Spines hooked, slender, spreading. Seed-pod stalk awned.

Small Burr Medick is valuable as feed in the drier districts, but the burr is considered by some wool growers to be more troublesome than that of Rough Medick.

26. Black Medick (*Medicago lupulina* L.).—Annual or biennial.

Other names.—Nonesuch Clover, Yellow Trefoil, Hop Trefoil, Hop Clover, Black Medick Clover, English Trefoil.
Stem much branched, spreading, prostrate (ends ascending), four-angled, hairy.
Leaf markings absent. Leaflets egg-shaped, heart-shaped, or round-shaped. Middle leaflet stalk the longest. Margin toothed. Hairs on both surfaces, or only on under surface. Veins straight, not much branching. Mucronate (see Fig. 35).
Flowers yellow, small, numerous in rounded head on slender stalk longer than leaf and arising from angle of leaf-stalk. Stalk of head not awned. Calyx persistent, teeth narrow.
Stipule broad tapering, toothed or not toothed.
Seed-pod kidney-shaped, one-seeded, black when mature, tip spiralled. Seed yellow or greenish-yellow, with a marked projection, weighing about 1.6 gm. per thousand.

Black Medick is sown occasionally. Does well in a mixture under good rainfall. Has a strong taproot, and in moist conditions annual habit not as pronounced. Not recommended for inclusion in the best permanent pastures.

27. Snail Clover (*Medicago scutellata* L.).—Annual.

Stem prostrate to ascending, very hairy.
Leaf markings absent. Leaflets egg-shaped or wedge-shaped. Middle leaflet stalk the longest. Margin toothed. Hairy.
Flowers yellow, about quarter of an inch long, one to three in cluster on awned stalk shorter than leaf.
Stipule tapering, toothed.
Seed-pod coiled, but not a burr, no spines being present. Large ($\frac{1}{2}$ inch or more in diameter), downy, five to eight coils. Seed-pod stalk awned.
Seed large, yellowish, kidney shaped.

28. Rough Medick (Burr Medick) (*Medicago hispida* Gaertn = *M. denticulata*).—Annual.

Other names.—Trefoil, Burr Trefoil, Toothed Burr Clover, Burr Clover.
Stem prostrate to ascending, hairless, often four-angled.
Leaf markings absent on mature leaves; may be whitish and dark-red spots on young leaves. Leaflets broadly egg-shaped or wedge-shaped, the midrib produced to a small point (a mucro). Middle leaflet stalk the longest. Margin toothed towards free end. Hairs absent from upper surface, may be a few on under surface. Veins straight, little branching.
Flowers yellow, small, two to nine in loose cluster on an awnless stalk usually shorter than the leaf. Calyx teeth equal. Hairy.
Stipule large, with fine but conspicuous teeth.
Seed-pod a burr with one and a half to five coils, the spines stiff erect and sometimes hooked. Seed light brownish-yellow, kidney-shaped.

A number of varieties of Rough Medick occur, and some of these have been classed as distinct

Fig. 35.—Black Medick (Medicago lupulina).
[West Aust. Dept. of Agric.]

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species by some botanists. Among the more common varieties found are :—

var. *denticulata* Urb. (= *M. denticulata* Willd.), with hooked spines.

var. *apiculata* Urb. (= *M. apiculata*), with short spines, not hooked.

var. *confinis* Burnat (= *M. confinis*), with spines reduced to tubercles.

The characteristics of this species are too well known to require amplification.

29. Calvary Medick (*Medicago echinus* D.C.).—Annual.

Stem almost hairless, prostrate, angular.

Leaf markings absent. Leaflets broad wedge-shaped or egg-shaped. Middle leaflet stalk the longest. Margin toothed. Almost hairless.

Flowers yellow, small, in cluster of one to three on stalk longer than leaf.

Stipule teeth forming conspicuous fringe.

Seed-pod a large (½ inch diameter) burr, six to ten coils; spines long, curved, sharp, more or less flattened to pod.

Calvary Medick is regarded as a weedy species.

30. Button Clover (*Medicago orbicularis* All.).—Annual.

Other names.—Flat Snail Clover.

Stem prostrate to ascending, almost hairless.

Leaf markings absent. Leaflets egg-shaped to wedge-shaped. Middle leaflet stalk the longest. Margin toothed towards free end. Hairs few, mainly on under surface. Veins straight, little branching. Midrib of leaflet produced to a small point (mucro).

Flowers yellow, small, one to three on awned hairy stalklets shorter than the leaf.

Stipule fringed.

Seed-pod without spines, three to six coils, central coil the largest (see Fig. 19A). Stalk of seed-pod awned.

Seed yellowish-brown, flattened, very long.

31. Lucerne (*Medicago sativa* L.).—Perennial.

Other names.—Lucern, Alfalfa.

Stem erect, hairy, often four-angled towards the top.

Fig. 36.—Burr Medick (Medicago denticulata).

A.—Plant in flower. B.—Plant in fruit. C.—Burr (pod) seen from above. D.—Burr seen from side. E.—Flower.

[*West Aust. Dept. of Agric.*

Leaf markings absent. Leaflets oblong to wedge-shaped. Middle leaflet stalk the longest. Margin toothed. Hairy. Veins straight, little branching. Midrib extended past margin into small point (mucro).

Flowers violet, arranged in oblong inflorescences on stalks longer than the leaf.

Stipule usually coarsely toothed, with long narrow point.

Seed-pod without spines, two to five loose coils; contains two to six seeds.

Seed pale-buff to yellowish-brown; shape variable from kidney-shaped to oval and angular.

Common varieties of Lucerne are Hunter River, Tamworth, and Marlborough (New Zealand).

Fig 37.—Lucerne (Medicago sativa).
[*Mich. Agric. Coll., Bull. 267.*]

Melilots (*Melilotus species*).

32. Mediterranean Melilot (*Melilotus messanensis* All.).—Annual.

Stem procumbent, nearly hairless.
Leaf markings absent. Leaflets egg-shaped to wedge-shaped, or square-ended. Middle leaflet stalk the longest. Margin toothed towards free end. Hairs few.
Flowers yellow, in short loose inflorescence. Calyx ten-nerved, with unequal teeth.
Stipule pointed and toothed.
Seed-pod about a quarter of an inch long, ridged, with one to two seeds.

Mediterranean Melilot is an introduced plant of slight value.

33. Bokhara Clover (*Melilotus alba* Desr.).—Biennial to perennial.

Other names.—Sweet Clover.
Stem erect, almost hairless.
Leaf markings absent. Leaflets elongated egg-shaped or oblong-shaped. Middle leaflet stalk the longest. Hairs few, mainly on under surface. Margin toothed. Venation straight, practically unbranched.
Flowers white, in long rather loose spiky inflorescences.
Stipule long, narrow, pointed; with one long tooth at base.

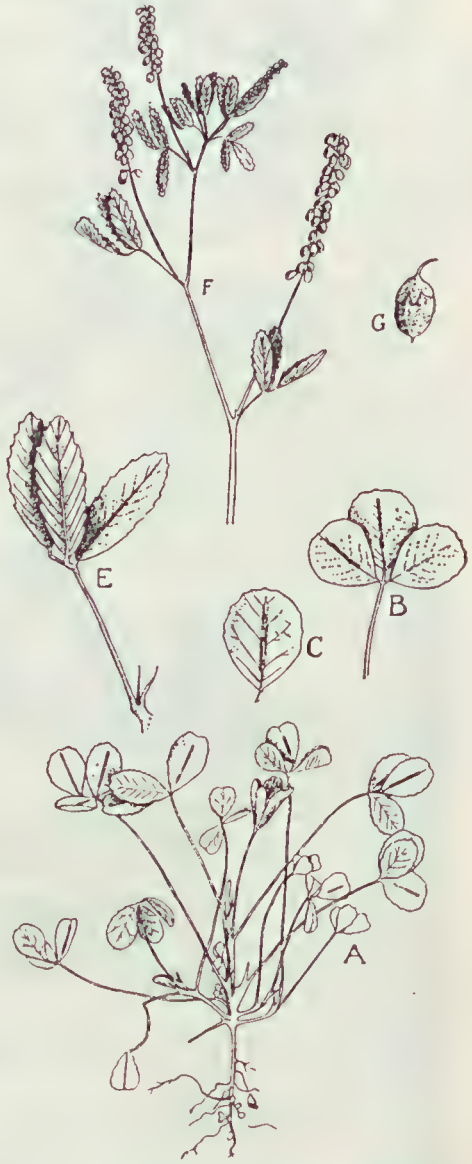

Fig. 38.—King Island Melilot (Melilotus indica).
[*West Aust. Dept. of Agric.*]

Seed-pod egg-shaped, wrinkled, hairy, black; one (rarely two) seeded.

Seed kidney-shaped; well-developed groove down one side.

Hubam is a supposedly strictly annual variety of Bokhara Clover. Bokhara Clover and Mediterranean Melilot are the most valuable of the melilots found in Victoria, being low in cumarin, which imparts a disagreeable flavour to milk, &c.

34. King Island Melilot

(*Melilotus indica* All. = *Melilotus parviflora* Desf.). —Annual.

Other names.—Hexham Scent, Sweet Melilot, King Island Clover.

Stem erect, almost hairless, except towards end.

Leaf young leaves have brownish streak along lower part of midrib of each leaflet; this disappears with age. Leaflets egg-shaped to wedge-shaped, and rather fleshy. Middle leaflet stalk the longest. Margin toothed. Hairs very few or none. Veins straight, practically unbranched. The cumarin present in the leaves causes a strong odour when they are crushed.

Flowers yellow, small, arranged in dense spiky inflorescence. The main stalk of this is hairy at first. Calyx hairy, with five equal teeth.

Stipule free part lance-shaped, lower part often shows small teeth.

Seed-pod almost globular, brownish, wrinkled, one-seeded.

Seed rough surfaced. In wheat for milling 3 per cent. of these seeds may spoil the flour.

King Island Melilotus has proved valuable on poor sandy coastal country as a soil-improver, but cannot be recommended on dairying or wheat-growing land. Generally speaking, in Victoria it may be classed as a weed.

Bird's-foot Trefoils (*Lotus Species.*)

35. Bird's-foot Trefoil (*Lotus corniculatus*).—Perennial.

Other names.—Minor Bird's-foot Trefoil, Bird's-foot Clover, Cheese-cake Grass, Butter Jap, Crow-toes, Shoes-and-stockings.

Stems arise from a short thick creeping stem, and vary from almost prostrate to almost erect. Usually hairless, but may show a few scattered hairs, and very rarely have long soft hairs.

Fig. 39.—Lotus Major (Lotus uliginosus).

A.—Flowering stem. B.—Leaf. C.—Inflorescence. D.—Flower. E.—Pods. F1.—Seed of Bird's-foot Trefoil. F2.—Seed of Lotus Major. G.—Pod after opening. H.—Basal habit.

[*West Aust. Dept. of Agric.*]

Leaf markings absent. Leaflets egg-shaped and pointed. Middle leaflet stalk the longest, although this may not be pronounced on some of the leaves. Margins not toothed. Hairs very few. Veins few, straight, not much branched.

Flowers yellow, often tinged with bright-red. Small, three to eight in a cluster.

Stipule really a leaf—broad and with midrib to one side (see Fig. 20).

Seed-pod long (1 inch to 1½ inches), straight, purplish red. Seeds partially separated by transverse partitions.

Seed brown, small, rounded-oval; often with a few darker spots.

Bird's-foot Trefoil is a useful species in rough country under good rainfall, and also in swampy situations.

36. LOTUS MAJOR (*Lotus uliginosus* Schk. = *Lotus major* Sm.).—Perennial.

Other names.—Greater Lotus, Greater Bird's-foot Trefoil, Marsh Bird's-foot Trefoil, Beech Forest Clover, Otway Forest Clover.

Stems nearly erect, but weak; hollow.

Leaf markings absent. Leaflets egg-shaped and pointed; side leaflets with midrib off-centre. Middle leaflet stalk the longest, although often not conspicuously so. Often with bright-red colouration at junction of leaflet stalks. Margin not toothed. Hairy. Veins few.

Flowers rich-yellow; five to twelve in cluster. Calyx teeth in bud spreading like a star.

Stipule smaller than side leaflets, almost rounded, midrib off-centre. Actually a leaflet.

Seed-pod long, cylindrical.

Seed greenish, very small.

Lotus Major may be considered a variety of Bird's-foot Trefoil. It is useful under conditions similar to those which suit the latter species.

Fig. 40.—Top.—Narrow-leaved Lotus (Lotus angustissimus); Bottom.—Boyd's Clover (Lotus hispidus).

A and F.—Portion of stem. B and G.—Leaf. C and H.—Inflorescence. D and I.—Flowers. E and J.—Pods and seed.

[*West Aust. Dept. of Agric.*]

37. NARROW-LEAVED LOTUS (*Lotus angustissimus*).—Annual.

Other names.—Slender Bird's-foot Trefoil.

Stems slender, branching, softly hairy.

Leaf markings absent. Leaflets pointed egg-shaped; middle leaflet stalk the longest. Margin not toothed. Veins few and straight.

Flowers yellow, small; one to two (occasionally three or four) in cluster. Calyx teeth very long.
Stipule actually a leaflet, with midrib off-centre.
Seed-pod cylindrical, up to one inch long.

38. Boyd's Clover (*Lotus hispidus*).—Annual.

Other names.—Giblet Grass.

Boyd's Clover resembles *Lotus angustissimus* (No. 37). It is a very hairy plant, with thick seed-pods. This species is more drought-resistant than *Lotus major*, and has been sown with success, away from swampy areas, in good rainfall districts.

39. Austral Trefoil (*Lotus australis* Andr.).—Perennial, sometimes almost shrubby.

Other names.—Austral Bird's-foot Trefoil, Barwon River Lucerne.
Stems erect.
Leaf markings absent. Leaflets narrow. Middle leaflet stalk the longest.
Flowers pink or white.

Austral Trefoil is a native plant, possessing poisonous properties on occasion. Variety *parviflorus* has solitary flowers or two to three in a cluster, and the flowers are smaller than the type.

40. Winged Pea (*Lotus tetragonolobus* L.).

Other names.—Square-pod Pea, Asparagus Pea.
Stem very hairy.
Leaf markings absent. Middle leaflet stalk the longest. Leaflets egg-shaped to wedge-shaped. Dull-green. Margin not toothed. Veins few, indistinct. Hairy, Mucronate.
Flowers scarlet or purplish-red, large, almost stalkless; clustered at end of a long stalk. Calyx lobes unequal.
Stipule small, midrib off-centre. Actually a leaflet.
Seed-pod straight, cylindrical, four-winged, with membranous partitions between the seeds.

Winged Pea occurs in some districts as a volunteer, but it is not now sown.

Wireless Talks for Farmers

New Session Arranged

WITH the co-operation of the Australian Broadcasting Commission, the Victorian Department of Agriculture has arranged for a new series of wireless talks on subjects of particular interest to the man on the land. These talks will be broadcast from the regional stations, 2CO (Corowa), 3GI (Gippsland), and 3WV (Horsham) on alternate Friday evenings, the first being on Friday, 17th March. The 15-minute session will commence at 7.40 p.m.

In order that these talks might be of maximum value to the farming community the Department is anxious to have the co-operation of listeners, who are invited to submit questions they would like answered over the air. If you have any particular problem connected with the management of your farm, your crops, or your live stock, or with the marketing of your produce, send a letter to Mr. J. Keane, B.Agr.Sc., Department of Agriculture, Melbourne. Your problem will then be submitted to expert officers of the Department, whose advice will be given. If you do not desire your name broadcast use initials or a nom-de-plume, but do not omit to mention your district.

Chutney

By Miss A. Knight

CHUTNEY is a well-known relish, which appears to be of East Indian origin. Fruit pulps and certain vegetables may be used as a basis for this preparation, and these may be supplemented by the addition of salt, sugar, vinegar, and spices; raisins sometimes enter into the composition of this particular preserve.

Such fruits as apples, tomatoes, pears, mangoes, and guavas are suitable foundation; while, chillies, ginger, garlic, or other piquant flavourings may be added to suit the taste. Some palates prefer much more highly spiced and sweetened foods than others, and it is a safe rule to season moderately, blending all ingredients well together. All the ingredients should be cooked until the mixture has the appearance and consistency of a solid sauce.

Chutneys may be served with cold meats, sausages, curries, &c. The following is one in which apples and tomatoes form the foundation:—

Fruit Chutney.

2 lb. melon.
2 lb. apples.
½ lb. green tomatoes.
½ lb. onions.
1 lb. sugar.
1 pint vinegar.
¼ lb. preserved ginger.
2 small teaspoons cloves.
2 small teaspoons pimento.
1 teaspoon salt.
1 small teaspoon mustard seed.

Peel, seed, and cut melon into small blocks, and boil it in water until three parts cooked, then drain it. Tie cloves and pimento in a spice bag and simmer all ingredients in the vinegar till a good colour and consistency. This usually takes about two hours.

Green Tomato Chutney.

12 lb. green tomatoes.
2 lb. onions.
3 lb. sugar.
1½ oz. ginger.
½ oz. cloves.
½ oz. wholespice.
½ oz. peppercorns.
1 teaspoon mustard.
2 qrts. vinegar.

Method.—Cut the tomatoes into about four sections, sprinkle with salt, and allow to remain 24 hours or so, then drain off the water which the salt has drawn. Meanwhile, spice and sweeten the vinegar, and put the drained tomatoes and onions into it, cooking until well blended.

Tomato Relish.

3 lb. ripe tomatoes.
1 lb. onions.
1 lb. sugar.
1 tablespoonful curry powder.
1½ tablespoons mustard.
2 tablespoons flour.
Salt and pepper to taste.

In making the relish, scald the tomatoes first by immersing them in boiling water for a few minutes, then immediately dip them into cold water; this process loosens the skins, and they may be quickly and easily peeled without waste. Peel and slice the onions. Put all into a bowl, sprinkle with the salt, and allow to remain overnight, and next morning put into the preserving pan with just sufficient vinegar to cover; add the sugar, and boil gently for about one hour, then moisten the dry ingredients with a little cold vinegar, and stir them into the mixture. Boil altogether for another hour or until of a nice consistency.

Ripe Tomato Chutney.

4 lb. ripe tomatoes.
2 lb. apples.
1 lb. onions.
¼ lb. sultanas.
2 level teaspoons salt.
¼ teaspoon pepper.
½ dozen cloves.
1 small piece of whole ginger.
3 small chillies.
1¼ pint vinegar.
1¼ lb. sugar.
1 teaspoon mustard seed.

Peel, core, and cut up the apples, peel and slice the onions and tomatoes. Tie the cloves, ginger (bruised), and chillies in a spice bag and simmer till a good consistency (about two hours).

Gooseberry Chutney.

4 lb. ripe gooseberries.
1 pint vinegar.
1½ lb. sugar.
½ oz. garlic.
1 small teaspoon salt.
A trace cayenne.
2 teaspoons pimento.
1 teaspoon cloves.
1 tablespoon raisins or sultanas.

Top and tail the gooseberries, peel the garlic, cut it very small and tie in spice bag with pimento and cloves. Simmer all together till well blended (about one hour).

Making Fruit Chutney.

Apple Cucumber Relish.

2 lb. apple cucumbers.
½ pint vinegar.
1 lb. sugar.
1 oz. preserved ginger.
4 small dried chillies.
½ teaspoonful mustard seed.

Peel the cucumbers and pass them through a mincer, using the second-size cutter. Place the mince in a bowl, and sprinkle lightly with salt, cover with a plate, and allow to remain for twelve hours. Drain thoroughly, rinse quickly in fresh water, and drain well. Then cook all of the ingredients slowly for about twenty minutes, bottle, and cork.

Plum Chutney.

For plum chutney either the President, Grand Duke, Diamond, or Early Rivers plums give excellent results.

4 lb. plums.
1 lb. onions.
1 quart vinegar.
½ lb. sugar.
2 teaspoons whole ginger (bruised).
2 teaspoons whole cloves.
¼ teaspoon ground pepper.
2 teaspoons mustard seed.
6 small chillies.

Tie the spices in a muslin bag and suspend. Cook the mixture (without a lid on pan) slowly for two hours. Seal either hot or cold.

Gooseberry Chutney.

4 lb. ripe gooseberries.
1 pint vinegar.
2 lb. sugar.
About 6 small red chillies.
½ teaspoon salt.

Cook together quickly for fifteen to twenty minutes, and then bottle.

Spiced Tomato Butter.

5 lb. nice red tomatoes.
1½ lb. apples.
4 lb. sugar.
1 pint vinegar.
¼-oz. stick cinnamon.
¼ oz. ginger.
2 blades mace.
Few cloves.

Cook the mixture rather slowly for about three hours, or until all ingredients are nicely blended.

Certification of Potato Seed [*Continued from page 114.*]

grows his own seed. It is suggested to these men that they will take an important step in elevating the general standard of the potato industry besides improving the quantity and quality of their own produce, if the next season they put aside say an acre of their crop for seed production purposes and make application for seed certification. The day when any potato is regarded as good enough for seed should have gone years ago. The sooner it is generally realised that good seed is the only basis for a good crop, the better off the individual and the State will be.

By A. W. Jessep, M.Agr.Sc., B.Sc., Dip. Ed., Principal, School of Horticulture, Burnley.

Garden Notes.

ALTHOUGH the recent rains have been very beneficial to the gardens, the abnormally dry summer has practically reduced the activities to maintenance work. Unfortunately, the annuals which usually make such a beautiful autumn display have had to be neglected so that the perennials might be saved.

Lawns have suffered so long that many of the finer grasses will probably be lost, and when the autumn and winter rains fall, these areas will require careful attention. The method of restoration will depend upon the type of lawn and the extent to which it has been impaired. Stoloniferous grasses, such as buffalo, couch, and kikuyu will readily respond to top-dressing, and unless very seriously damaged will recover with careful treatment. The English grasses, such as the perennial rye grass, chewings fescue, and brown top varieties will need more careful attention. If most of the grass has dried off, and after the autumn rain weeds are prevalent, it may be necessary to work up the area and resow it. This would be the quicker and more satisfactory way of establishing a good even turf again. It is very inconvenient to sow grass on any large dead patches and give them the treatment necessary without neglecting the other portion of the lawn.

If the damage does not warrant putting down a new lawn and the area is relatively small, the ground may be loosened with a digging fork, which should be pushed well into the soil and then given a slight movement. This is a rather laborious job, but will open up the ground. Sow about ½ to ¾ oz. per square yard of the desired seed mixture and then top-dress at the rate of about 1 cubic yard of good sandy loam per 100 square yards of lawn. If this be done in April or early May, the lawn should be firmly established and ready to withstand an average summer.

If dahlia blooms are kept well picked the plants will go on flowering until well into May. As the dahlia is very shallow-rooted, hoeing should be discontinued and a heavy mulching of straw, or stable manure with plenty of straw

in it, added. This mulch will prevent the ground from caking after watering, will allow the plants to be attended to without any consequent consolidation of the soil, will guard against excessive loss of water by evaporation and tend to keep the surface soil at a more even temperature.

Sow seeds of anemone, ranunculus, Iceland poppy, wallflower, carnation, pansy, violas, dianthus, and winter-flowering sweet-peas, and plant out seedlings of any of these as soon as a good soaking rain arrives. In the meantime, keep the ground free of weeds and ready for quick transplanting.

Vegetables.

Make further sowings of lettuce, French beans, carrots, parsnips, radishes, parsley, and beet root, and plant out seedlings of the early cabbage varieties. This will be the last sowing of French beans. An early sowing of broad beans may be made.

Keep the vegetables well picked to prolong the producing period. If they are allowed to remain on too long, the plant will soon commence to die off; this is particularly so with cucumbers, French beans, and climbing beans.

The ends of the runners of pumpkins and melons should be removed to allow food to be reserved for the development of the edible portion instead of the production of more vine. If pumpkins are not already formed they will probably be too late to ripen before the vine growth is stopped by frosts.

Prepare for the division of culinary herbs. Rhubarb plants more than two or three years old will need attention. Rhubarb is a very useful plant in the vegetable patch and no garden should be without this healthy and easily grown plant. If given plenty of water and farm-yard manure it will produce a large amount of nutritious food. During the late autumn take up the plants. Give the bed a good digging-over and if no farm-yard manure is available work in about 4 oz. of market garden manure to the square yard. Divide the plants, select the best crowns for replanting and place them about 3 feet apart with about 4 feet between the rows. Eight or ten plants well cared for should supply sufficient stalks for the average household.

Orchard Notes

By J. L. Provan, B.Agr.Sc., Senior Horticultural Instructor.

MANY varieties of pome fruits, canning peaches, passion fruit, and nuts will be harvested during March. In Victoria, only the pome fruits are cool stored commercially. The importance of correct maturity of the fruit at harvest time has been shown repeatedly in cool storage experiments.

Cultivating a citrus grove after irrigation.

Although the Jonathan apple is the most popular variety cool stored in Victoria, it is a very difficult variety to store successfully, unless particular attention is paid both to the stage of maturity at picking time, and the temperature conditions under which it is stored. If picked too early, while the ground colour is still green, this variety is liable to shrivel and will lack quality when removed from store. A common complaint with Jonathans late in the season is that they become mealy due to over-mature fruit being stored for too long a period. The correct stage to pick this variety is when the ground colour is a greenish yellow. It will then

store and ripen with maximum flavour and quality. The temperature of storage should be 36° F., until the end of April, then 34° F., until the end of May, and from then onwards, 32° F. By adopting this series of temperatures for the periods specified, storage disorders of the Jonathan can be practically eliminated.

When cool stored, some varieties of apples, i.e., Granny Smith, Ballarat (Stewart), and Delicious develop superficial scald, a condition recognized by the appearance on the surface of the fruit of a mottled, light brown discolouration, which later may enlarge, become darker and the mottling disappear. Growers have reduced, and in some cases overcome, this condition by delaying the storage for from twelve to sixteen days after picking. This allows the fruit to develop wax. Recent tests have shown, however, that complete control of superficial scald in Granny Smith, Ballarat, and Delicious varieties may be obtained by the use of oil wraps, the fruit being placed in storage immediately after picking.

In orchards where the annual growth of the trees is small, the practice of sowing green manure crops should be adopted to increase the soil fertility. Several methods can be used. The grower may stimulate the growth of natural herbage by the application of artificial fertilizers during March. With soils of very low fertility it is necessary to apply both sulphate of ammonia and superphosphate at the rate of 2 cwt. of each per acre. This mixture will stimulate the growth of cereals as well as legumes. The quantity of sulphate of ammonia may be reduced to 1 cwt. per acre on soils which are more fertile.

In orchards where the natural herbage does not make sufficient bulk for ploughing under, green manure crops should be sown. In northern orchards on the lighter soil types, tick beans are recommended. These should be sown in early March at the rate of 1 to 1½ bushels per acre with 2 cwt. of superphosphate. The sowing of field peas alone at the rate of 1 bushel per acre, or mixed with barley, ½ to 1 bushel per acre, with 2 cwt. of superphosphate is the recommended practice for southern Victoria. The addition of 1 cwt. of sulphate of ammonia per acre to these crops will result in very early establishment on the poorer soil types.

The practice of autumn fertilizing can be confidently recommended to orchardists. The impression has been gained that autumn applications of fertilizers may be lost because of the leaching by winter rains. Actually, however, if applied early, say, early in March with or without green manure crops, these fertilizers will be retained either by the green manure crop, or by the new root growth of the trees which takes place during the autumn. Recent investigations have shown that although the above-ground portion of the trees has ceased growth, beneath the soil surface active root growth commences. It can be expected, therefore, that both the application of fertilizers and irrigation in the autumn will materially assist the tree to develop strong blossom buds for the next season. A warning, however, must be given against over-liberal application of both fertilizers and irrigation in a season like the present one, when the trees have had an enforced period of rest during the droughty conditions. If over-stimulated at this time, the trees may be forced into blossom.

During this month, codling moth can be very active and cause much damage to the mature fruit. The young larvae either "sting" or penetrate the fruit very rapidly, and, in order to overcome losses of fruit about to be harvested, it is advisable to resort to an ovicidal spray such as white oil emulsion 1 in 60, rather than to rely on a cover of arsenate of lead, which may succeed in poisoning the young larvae, but not until after they have caused the "stinging" of such fruit.

Subsoiling can be carried out at this time of the year. The best results are obtained when the soil is fairly dry because at this stage the fracturing of plough-sole and hard-pan is more extensive. In the Goulburn Valley, this season, difficulty was experienced in obtaining size in a number of varieties of fruit. This was caused partly by the restrictions in irrigation water, and partly by the difficulty of such irrigations to penetrate the impervious hard-pan layers frequntly found in the Goulburn Valley loams. From one to three subsoil cuts down the centre of each land will greatly assist penetration of irrigation water. Before subsoiling pear lands, a trial cut or two should be made on a few rows to ascertain whether much suckering will occur.

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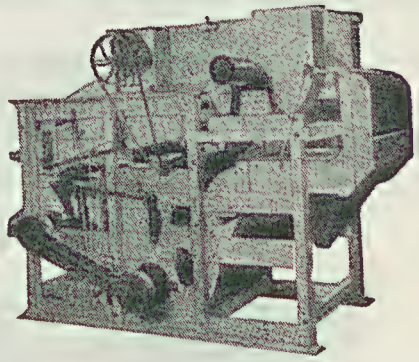

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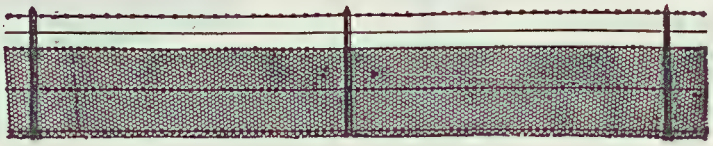

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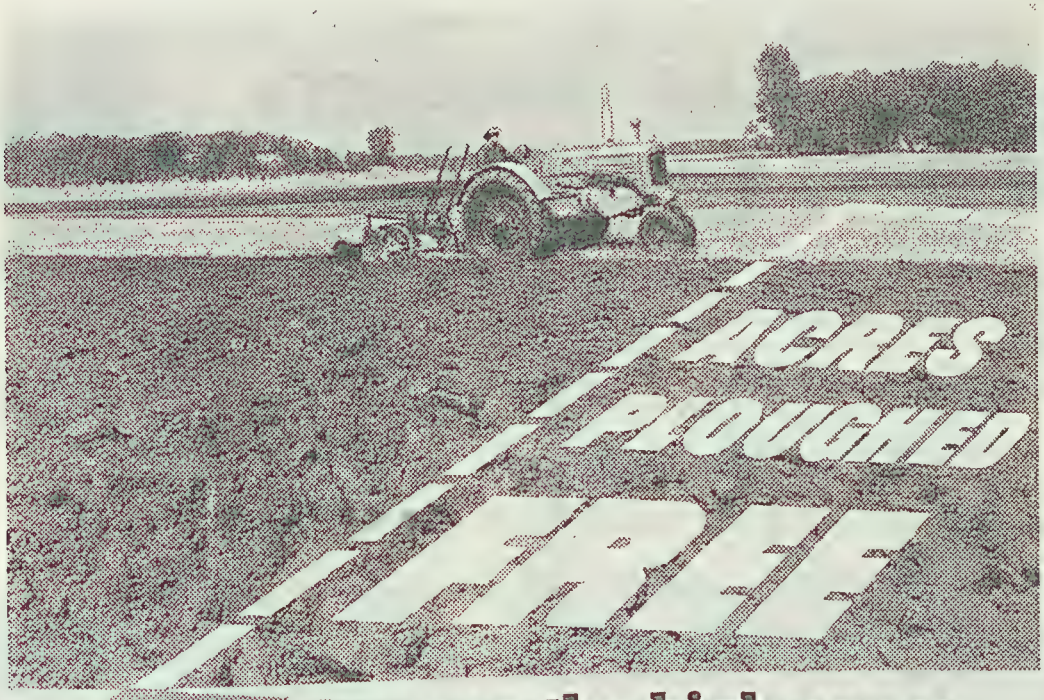

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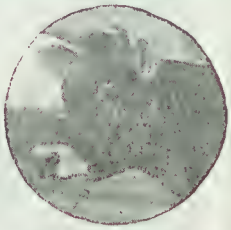

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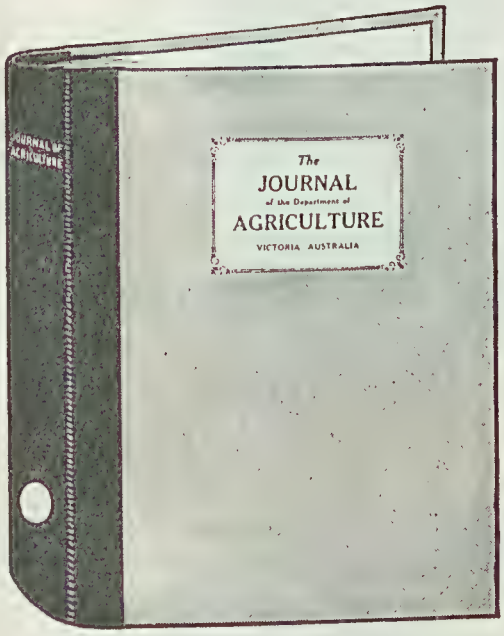

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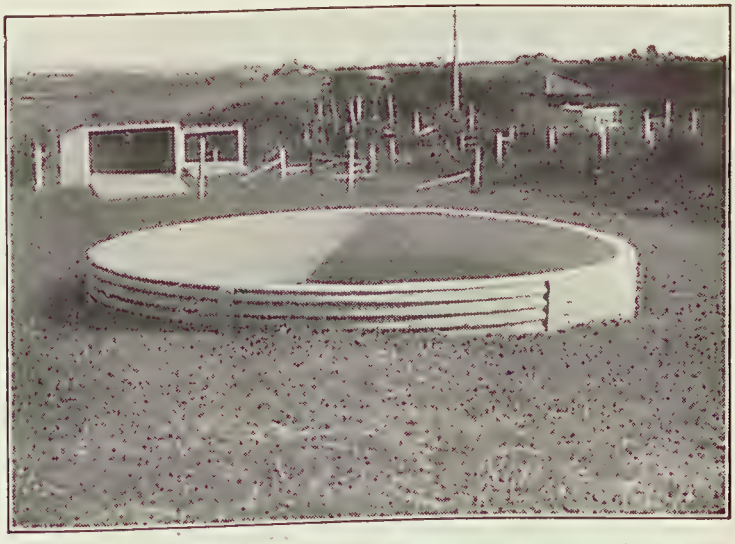

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DEPARTMENT OF AGRICULTURE

VICTORIA, AUSTRALIA

STANDARD HERD RECORDS

For Quarter Ending December, 1938

1617.

Standard Herd Records

For Quarter ended 31st December, 1938

In the following is set out the records of all cows which completed a lactation during the quarter. The number is 200, of which 113 qualified for the certificate. The figure in brackets after the owner's name shows the number of entries.

The amount of butter-fat required for qualification varies with the age class to which the animal belongs, the standard being as follow:—

Junior 2-year old (under 2½ years at time of calving)	230 lb. butter-fat.
Senior 2-year old (between 2½ and 3 years at time of calving) ..	250 lb. butter-fat.
Junior 3-year old (between 3 and 3½ years at time of calving) ..	270 lb. butter-fat.
Senior 3-year old (between 3½ and 4 years at time of calving) ..	290 lb. butter-fat.
Junior 4-year old (between 4 and 4½ years at time of calving) ..	310 lb. butter-fat.
Senior 4-year old (between 4½ and 5 years at time of calving) ..	330 lb. butter-fat.
Mature cow 5 years and over	350 lb. butter-fat.

(Except where otherwise stated, the period of test was 273 days.)

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Alston, N. B., and Sons, Romsey, Jersey (5).										
Craig Mohr Rose Petal ..	56948	28.12.37	19	4,891	4·79	234·17	270	Jr. 3	167 ..	Rosyth Jessie's Laird
Rosyth Gay Princess ..	55121	4.3.38	14½	6,114	5·23	319·61	310	Jr. 4	325, 295 ..	Werribee Gaypiece
Rosyth Meadow Lark ..	55126	15.1.38	21½	6,576	6·01	394·96	310	Jr. 4	330, 277 ..	Werribee Gaypiece
Rosyth Noble Countess ..	59335	11.1.38	13½	3,630	5·97	216 67	270	Jr. 3	272 ..	Werribee Gaypiece
Rosyth Tulip 2nd ..	59338	2.1.38	14	4,962	5·06	250·88	270	Jr. 3	239 ..	Werribee Gaypiece
Atkinson, W. K., Swan Hill, Dairy Shorthorn (6).										
Willow Park Blush 5th ..	D.S.H.B.	6.3.38	28	9,862	4·15	409·21	350	Mature	393, 430, 428, 438	Willow Park Banker 2nd
Willow Park Camelia 15th	D.S.H.B.	5.3.38	22	7,748	3·73	288·71	270	Jr. 3	.. ..	Wicklesham Lord Barrington 5th (Imp.)
Willow Park Comet 17th ..	D.S.H.B.	19.2.38	20½	7,266	3·75	272·75	230	Jr. 2	.. ..	Wicklesham Lord Barrington 5th (Imp.)
Willow Park Countess 10th	D.S.H.B.	27.1.38	33½	13,259	3·95	523·69	350	Mature	371, 415, 405, 451	Willow Park Reflector
Willow Park Duchess 24th	D.S.H.B.	28.2.38	26½	10,872	3·75	407·31	350	Mature	303, 362 ..	Willow Park Silvermine 4th
Willow Park Queenie 37th	D.S.H.B.	8.3.38	20	6,407	3·85	246·65	230	Jr. 2	.. ..	Willow Park Silvermine 8th
Ballarat Orphanage, Ballarat, Jersey (6).										
Orphanage Attractive 6th..	Vol. 25	6.2.38	14	4,400	6·11	268·93	270	Jr. 3	306 ..	Relford King Bracken
Orphanage Clara 2nd ..	54575	1.3.38	17½	7,617	5·21	396·91	310	Jr. 4	325 ..	Jerseylea Quality Boy
Orphanage Doris 5th ..	C.R.	21.2.38	18	4,788	5·34	255·49	230	Jr. 2	.. ..	Jerseylea Quality Boy
Orphanage Melba 6th ..	49970	9.1.38	25	8,310	4·77	396·11	350	Mature	375 ..	Murona Airmine
Orphanage Molly 6th ..	58823	16.2.38	15½	5,018	5·24	262·89	250	Sr. 2	253 ..	Relford King Bracken
Trawalla Clara 11th ..	42285	26.1.38	22	7,328	5·04	369·60	350	Mature	328, 272, 314	Kyora Substitute
Bassett-Smith, C., Kyabram, Red Poll (1).										
Temperley Dairy Plane ..	5976A	6.2.38	22½	6,709	4·50	302·19	310	Jr. 4	224, 314 ..	Temperley Dairyman
Black, Estate late Mrs. A. J., Noorat, Jersey (1).										
Strathkellar Dream Girl 6th	59528	19.3.38	11½	4,070	6·92	281·68	230	Jr. 2	.. ..	Bellefaire Blondes Bellozane
Black, Estate late I. S., Noorat, Ayrshire (2).										
Mount Noorat Poppy 6th..	29783	14.3.38	12½	6,593	4·59	302·91	250	Sr. 2	.. ..	Gowrie Park Scottish Patron
*Mount Noorat Peggy 2nd..	27559	22.3.38	4	2,475	4·36	108·03	330	Sr. 4	277, 212 ..	Gowrie Park Soldier
Box, Estate late Dr. J., Whittlesea, Jersey (1).										
Toorongo Aldan's Chevy ..	C.R.	28.1.38	11½	4,962	5·76	285·84	230	Jr. 2	.. ..	Staghorn Lord Aldan 3rd
Broad, Mrs. A. A., Sutton Grange, Jersey (1)										
Grangelea Rose	33040	4.3.38	24	8,582	4·69	402·17	350	Mature	411, 567, 561, 547, 444, 425	Banyule Airo
Butcher, F. T., Swan Hill, Red Poll (1).										
Maryville Elva	3722A	20.1.38	24	9,201	4·35	400·18	330	Sr. 4	304, 402, 356	Victoria King Bird
Calf, A. J., Werribee South, Jersey (1).										
Melrose Vanilla 30th	58397	2.1.38	16	7,158	6·17	441·56	310	Jr. 4	457 ..	Werribee Lord Fancy
Clarke, A. B., Glenormiston South, Jersey (1).										
†Denniston Princess 5th ..	Vol. 25	14.3.38	4	4,500	5·42	244·08	250	Sr. 2	.. ..	Noorat Guarantor

* 120 days in test. † 240 days in test.

Standard Herd Records—*continued.*

Name of Cow.	Herd Book No	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Clark, P. W., Whittlesea, Jesrey (4).										
Coodardy Gentle Annette 8th	C.R.	6.2.38	16	5,102	5·19	264·74	230	Jr. 2	..	Staghorn Lord Aldan 3rd
Coodardy Gloria 7th ..	C.R.	22.3.38	9½	4,956	5·72	283·54	310	Jr. 4	243, 368	Toorongo Belle's Bonaparte
Stoneycroft Roma 2nd ..	C.R.	20.3.38	17½	5,669	5·24	297·00	310	Jr. 4	334	Toorongo Mercedes King
Willis Vale Lad's Capture..	42512	31.12.37	13½	6,437	4·65	299·24	350	Mature	..	Willis Vale King's Lad
Colenso, L. W. R., Alvie, Jersey (2).										
Normandie Golden Nancy 2nd	58743	22.2.38	14½	4,500	5·55	250·00	250	Sr. 2	..	Normandie Noble Thorn
Normandie Hawthorn 6th..	54489	16.1.38	21½	5,739	4·59	263·47	290	Sr. 3	258	Lucerne Vale Noble Master
Coughlin, C., Catani, Jersey (5).										
*Gladys Park Beauty 2nd..	C.R.	10.3.38	4	3,285	5·73	188·39	270	Jr. 3	343	Werribee Bluebell's Masterpiece
Gladys Park Beauty's Choice	Vol. 25	16.3.38	17	5,446	5·05	275·08	270	Jr. 3	290	Gladys Park Jessie's Masterpiece
Gladys Park Gaiety Girl 3rd	Vol. 25	27.2.38	5½	2,915	6·20	180·63	250	Sr. 2	251	Werribee Bluebell's Masterpiece
†Gladys Park Master's Lady	48212	23.2.38	4	1,485	5·98	88·80	330	Sr. 4	279, 342	Werribee Bluebell's Masterpiece
Gladys Park Master's Petal 3rd	Vol. 25	14.3.38	10	4,139	5·55	229·55	250	Sr. 2	212	Werribee Bluebell's Masterpiece
Coulthard, J., and Son, Whittlesea, Jersey (3).										
Elmwood Merry Lark ..	57189	23.3.38	12½	6,497	5·15	334·51	350	Mature	363, 416	Austral Valley Lord Larkspur
Jubilee Laconia	44531	8.1.38	10½	3,810	6·03	229·73	350	Mature	334, 287	Jubilee Wheatenlight
Walamba Morning Star ..	50897	24.1.38	15	4,655	4·95	230·57	270	Jr. 3	280	Clarendon Eyre Brigadier 3rd
Crawford, Mrs. E., No. 1 Farm, Traralgon, Jersey (3).										
Balniel Golden Petal ..	38784	20.2.38	17	5,596	5·56	311·05	350	Mature	294, 349, 345, 344	Coolooli Jersey King
Balniel Island Fern ..	C.R.	10.2.38	19	3,681	4·83	177·68	230	Jr. 2	..	Wompini Royal Master
Pine Grove Madeira 2nd ..	Vol. 25	6.3.38	17	3,963	5·31	210·59	270	Jr. 3	..	Pine Grove Larkspur King
Daley, Mrs. G. S., Ecklin South, Jersey (5).										
Clarendon Eyre Cinderella	52253	28.3.38	18½	7,285	6·18	449·94	350	Mature	331	Clarendon Eyre Eminents Achievement
Clarendon Eyre Primrose 2nd	47632	1.2.38	28½	7,028	5·54	389·54	350	Mature	368	Victorious Pioneer (Imp.)
Clarendon Eyre Tangerine 9th	56813	14.3.38	24	7,421	5·05	375·01	350	Sr. 4	..	Victorious Pioneer (Imp.)
Glen Iris Golden Dream ..	57356	23.1.38	16	4,635	6·01	278·36	230	Jr. 2	..	Design's Golden Oxford (Imp.)
Werribee Fancy Madeira ..	17715	10.1.38	34	9,428	5·72	539·42	350	Mature	486, 512, 647, 626, 692, 698, 438	Masterpiece (Imp.)
Department of Agriculture, Burnley, Jersey (1).										
‡Victoria Lady Vamp ..	59872	1.3.38	..	3,660	5·90	216·03	230	Jr. 2	..	Melrose Essex
Department of Agriculture, Werribee, Friesian (6).										
Victoria Choree	5105	6.2.38	16½	10,394	3·86	401·10	330	Sr. 4	263, 357	Victoria Double Top
Victoria Double Plebe ..	Vol. 14	27.1.38	26	15,503	3·18	492·82	350	Mature	369	Victoria Double Top
Victoria Ilkedes	3763	18.1.38	28	9,272	3·50	324·16	350	Mature	381, 419, 490, 383	Victoria Joyous Mercedes
Victoria Quilt	3767	20.2.38	38	15,947	3·67	585·93	350	Mature	328, 480, 553, 507, 440, 549	Victoria Topnote
Victoria Soprano ..	3265	3.2.38	23½	12,876	3·07	395·08	350	Mature	372, 454, 496, 527	Victoria Topnote
Victoria Woodcrest Daisy..	5112	11.3.38	26½	11,810	3·52	416·04	350	Mature	307, 389, 425	Victoria Joyous Mercedes
Department of Agriculture, Werribee, Red Poll (18).										
Victoria Bassora	Vol. 10	28.2.38	11½	4,556	4·82	219·62	230	Jr. 2	..	Victoria Goblin
Victoria Belladonna ..	6006A	20.1.38	17	5,723	4·74	271·22	250	Sr. 2	..	Woodburn Peter Pan
Victoria Bright Bell ..	3010A	27.1.38	10½	5,987	4·18	250·09	350	Mature	246	Dominion Bright Belgian
Victoria Bursary ..	4884A	10.2.38	13	6,852	4·65	318·61	310	Jr. 4	265, 309	Dominion Bright Belgian
Victoria Cashier	C.R.	24.1.38	11½	5,387	4·32	232·74	230	Jr. 2	..	Woodburn Peter Pan
Victoria Casino	4046B	10.2.38	12	6,342	4·19	265·85	350	Mature	230, 285, 287	Victoria Royal Ringer
Victoria Fustian	C.R.	1.2.38	15	4,844	5·22	252·68	230	Jr. 2	..	Woodburn Peter Pan
Victoria May Belle ..	C.R.	10.1.38	12½	5,792	4·05	234·66	230	Jr. 2	..	Woodburn Peter Pan
Victoria May Queen ..	3514AA	11.2.38	21	9,726	3·87	376·12	350	Mature	271, 298, 366	Victoria Royal Ringer
Victoria Mount Etna ..	Vol. 10	30.1.38	14	5,430	4·86	263·69	230	Jr. 2	..	Chandpara Valentine
Victoria Prune	Vol. 10	7.2.38	24½	6,383	4·33	276·59	230	Jr. 2	..	Woodburn Peter Pan
Victoria Rebel	2333A	6.3.38	22½	8,783	4·24	372·50	350	Mature	327, 310, 427, 404, 392, 360, 422	Vice Regal
Victoria Red Tape ..	C.R.	17.1.38	16½	5,167	4·96	255·65	230	Jr. 2	..	Woodburn Peter Pan
Victoria Richmond ..	Vol. 10	4.3.38	24	8,210	4·76	390·55	230	Jr. 2	..	Woodburn Peter Pan

* 240 days in test. † 210 days in test. ‡ 240 days in test (sold).

Standard Herd Records—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Department of Agriculture, Werribee—*continued.*										
Victoria Rosary	2759AA	18.1.38	5	6,305	4·33	273·13	350	Mature	215, 259, 299	Victoria Major Royal
Victoria Venetia	4895A	6.1.38	19	8,205	4·37	358·70	310	Jr. 4	254, 306 ..	Victoria John Bull
Victoria Wild Rose ..	3042A	17.1.38	18½	8,481	4·68	396·96	350	Mature	228, 269, 313, 315, 300, 292	Vice Regal
Victoria Wildwood ..	Vol. 10	9.1.38	12½	8,366	4·22	353·29	270	Jr. 3	.. ..	Woodburn Peter Pan
Dwyer, G., Balwyn, Jersey (2).										
Karalee Linda 5th ..	53477	21.1.38	11½	3,165	6·47	204·77	270	Jr. 3	138 ..	Karalee Linda's Volunteer
Karalee Lotus 2nd ..	Vol. 25	10.1.38	9	2,714	5·64	153·04	230	Jr. 2	.. ..	Karalee Linda's Volunteer
Fairchild and Clutterbuck, Tinamba, Jersey (1).										
Vaucluse Empress 3rd ..	51013	2.1.38	14½	6,185	5·89	364·58	330	Sr. 4	318, 336, 392	Somerville Concentration
Fixter, A., Boisdale, Guernsey (1).										
Avonview Golden Daffodil	3966	16.3.38	24½	6,831	5·16	352·20	350	Mature	307 ..	Avonview Golden Lord
Fixter, W., Boisdale, Jersey (1).										
Olivedale Pearl	41372	31.12.37	23½	7,206	5·39	388·60	350	Mature	334, 413, 464, 450	Studleigh Masterpiece
Foster Bros., Boisdale, Jersey (6).										
Boisdale Blonde 3rd ..	Vol. 25	3.3.38	9½	3,092	5·08	157·12	230	Jr. 2	.. ..	Boisdale Dazzler
Boisdale Butterfly 2nd ..	47288	24.3.38	7½	5,816	5·05	293 84	350	Mature	297 ..	Gladiator of Springhurst
Boisdale Fuchsia .	43051	1.1.38	12½	4,734	5 95	281 79	350	Mature	353, 230 ..	Gladiator of Springhurst
Boisdale Hazel	51845	20.3.38	11	5,678	4·52	256·74	290	Sr. 3	213 ..	Boisdale Dazzler
Boisdale Nightshade ..	43054	20.1.38	4	3,986	5·09	202·90	350	Mature	221, 263, 261	Gladiator of Springhurst
Studleigh Harebell 21st ..	59548	5.1.38	14	4,245	5·80	246·21	310	Jr. 4	251 ..	Studleigh Harebell's Napoleon
Fraser, G. A., Addington, Ayrshire (1).										
Glengowrie Ray	28468	4.3.38	28	12,794	5·29	677·09	350	Mature	297, 401, 663, 794	Glengowrie Bold Baron
Gay, R. G. and Son, North Devon, Jersey (2).										
Elm Grove Laurette 2nd ..	Vol. 25	8.3.38	17	6,017	5·15	310·06	230	Jr. 2	.. ..	Elm Grove Graceful's Masterpiece
Elm Grove Silvermine ..	39643	17.2.38	15	4,865	5·92	287 97	350	Mature	310, 426, 414, 498	Warenda Ragtime Dominant
Goddard, J. H., Cora Lynn, Ayrshire (1).										
Inverurie Heather ..	27416	6.3.38	15½	9,699	4 14	401 73	310	Jr. 4	420 ..	Oakbank Radio
Handbury, J. E. and Son, No. 1 Farm, Toora, Jersey (1).										
Tooravale Milkmaid 25th ..	Vol. 25	6.3.38	20	7,792	5·46	425·72	230	Jr. 2	.. ..	Pinewood's Aristocrat (Imp.)
Handley, S. C., Dandenong, Jersey (1).										
Barrowby Rosalind ..	47135	8.2.38	34	9,257	5·44	503·25	330	Sr. 4	337, 442, 545	Grangelea Progress
Harvey, T., Boisdale, Jersey (6).										
Jerseyholm Bluebell 30th ..	57844	13.2.38	17	5,468	4·22	230·90	230	Jr. 2	.. ..	Jerseyholm Master's Fox 6th
Jerseyholm Empress 30th ..	40377	26.3.38	17	4,502	5·82	261·92	350	Mature	326, 363, 316, 317	Werribee Master's Fox
Jerseyholm Empress 48th ..	57846	24.1.38	21½	6,695	5·04	337·19	250	Sr. 2	.. ..	Jerseyholm Master's Fox 6th
Jerseyholm Empress 53rd ..	57850	1.2.38	13	4,256	5·09	216 53	230	Jr. 2	.. ..	Jerseyholm Master's Fox 6th
Jerseyholm Lady Marge 11th	37513	9.1.38	26½	7,380	5·33	393·56	350	Mature	277, 379, 440, 456	Lord Island Fancy of Brucevale
Jerseyholm Lady Marge 14th	53367	23.1.38	18	6,089	6·00	365·62	310	Jr. 4	273, 249 ..	Werribee Master's Fox
Haywood, Dr. A. R., Hastings, Jersey (2).										
Windrest Day Lady ..	Vol. 25	25.3.38	15½	4,969	4·77	237·21	230	Jr. 2	.. ..	Windrest Chevy's Chap
Windrest Jonquil ..	Vol. 25	26.3.38	10	4,728	5·70	269·41	250	Sr. 2	.. ..	Windrest Chevy's Picador
Henderson, W., Grasmere, Ayrshire (6).										
Carracoorte Balm 19th ..	27004	12.2.38	14	5,978	4·00	239·07	350	Mature	278, 171 ..	Carracoorte Kathleen's Pride
Carracoorte Balm 25th ..	30254	12.2.38	26	4,490	4·27	191·63	230	Jr. 2	.. ..	Grand View Bernie
Carracoorte Briar Bud 5th..	30257	16.3.38	15	5,052	4·21	212·55	250	Sr. 2	.. ..	Carracoorte Belle's Victory
*Carracoorte Brownie 25th	28169	31.12.37	4	4,500	3·95	181·23	330	Sr. 4	142, 203 ..	Grand View Bernie
Carracoorte Filpail 20th ..	24690	7.3.38	15½	5,825	4·40	256·57	350	Mature	270, 444, 180, 350	Carracoorte Lochiel
†Carracoorte Iris 27th ..	30263	13.2.38	..	6,210	4·12	255·57	310	Jr. 4	.. ..	Carracoorte Boomerang
Hore, E., Leitchville, Jersey (1).										
Taranah Roseleaf 4th ..	37589	23.2.38	22½	9,231	5·30	489·49	350	Mature	445, 450, 525	Taranah Submarine
Hurrey, W. H., Koonwarra, Jersey (2).										
Kooreena Maranta 11th ..	49036	9.2.38	23	6,080	6·34	385·27	310	Jr. 4	310, 418 ..	Kooreena Carrie 3rds Halo
Kooreena Mourier Queen 9th	49037	29.1.38	29½	6,705	5·34	357·81	310	Jr. 4	311, 410 ..	Kooreena Carrie 3rd's Delegate

* 240 days in test. † 240 days in test (sold).

STANDARD HERD RECORDS—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Le Noury, E., Werribee, Guernsey (2).										
Loulou's Darling 2nd of the Salines (Imp.)	3930	7.1.38	8	5,424	5·05	273·72	350	Mature	311, 242, 276, 265	Clara's Rambler of Maple Lodge
*Werribee Milkmaid ..	6483	14.3.38	4	4,970	4·53	225·11	230	Jr. 2	.. ..	Werribee Prince Don
Longerenong Agricultural College, Dooen, Ayrshire (3).										
Longerenong Acacia Elata..	26544	21.3.38	10	6,555	4·31	282·41	350	Mature	200 ..	Longerenong Baron
Longerenong Acacia Normalis	26546	24.2.38	17½	6,888	4·17	287·49	350	Mature	177 ..	Longerenong Noble
Longerenong Laurate ..	26557	13.3.38	13	6,759	4·33	292·71	350	Mature	347, 300, 234, 398, 394	Lily's Lad of Holly Green
Lyon, C. G., Heidelberg, Jersey (3).										
Banyarra Attraction 4th ..	51646	31.1.38	20	6,953	5·07	352·53	270	Jr. 3	.. ..	Banyarra Velvetation
Banyule Molly 46th ..	42886	13.2.38	20½	8,549	5·42	463·58	310	Jr. 4	355, 385 ..	Banyule Airo
Banyule Silvermine 53rd ..	25471	8.1.38	30	9,218	4·44	408·83	350	Mature	387, 445, 465, 545, 457	Air Lord of Banyule
Banyule Silvermine 99th ..	51658	23.2.38	16	5,604	5·91	331·01	230	Jr. 2	.. ..	Banyule Triplane
Banyule Tiddlewinks 9th ..	34198	11.1.38	29	8,502	4·92	418·18	350	Mature	314, 472, 448, 396	Concentration of Banyule
Banyule Tiddlewinks 16th ..	42895	12.3.38	14½	6,465	5·36	346·81	310	Jr. 4	309, 389 ..	Oxford Beau's Pretty Oxford (Imp.)
Gowanlea Oxford's Gipsy ..	37788	12.3.38	18½	7,170	5·05	361·83	350	Mature	324, 387, 488, 415, 367	Oxford Beau's Pretty Oxford (Imp.)
Kantara Wildflower ..	24582	24.1.38	29½	9,491	5·04	477·98	350	Mature	377, 487, 441	Ku Ku Fashion Plate (Imp.)
Macauley, C. W., Rochester, Jersey (1).										
Taranah Radiance 2nd ..	59634	19.2.38	20	6,354	5·73	364·05	250	Sr. 2	348 ..	Taranah Commander
McCosh, S. J., Wandin North, Jersey (2).										
Heathermont Brilliant Rosette	53156	27.2.38	17½	6,032	5·97	360·07	270	Jr. 3	303 ..	Glenvalley Masterman
Heathermont Countess Tex	57664	28.2.38	14	4,548	5·82	264·52	230	Jr. 2	.. ..	Glenvalley Masterman
McNabb, G. A., and Son, Irrewillipe East, Jersey (8).										
Maxon Bright Favourite 2nd	58343	4.1.38	17½	5,123	5·28	270·40	230	Jr. 2	.. ..	Maxon Starbright's Prince 5th
Maxon Chieftain's Light ..	58346	28.3.38	12½	6,290	5·11	321·59	250	Sr. 2	283 ..	Maxon Chieftain
Maxon Chietain's Lodestone 2nd	58347	13.3.38	16	5,864	5·54	324·83	250	Sr. 2	314 ..	Maxon Chieftain
Maxon Countess Linnacre..	45060	20.1.38	N.O.C.	5,435	6·08	330·19	350	Mature	400, 429 ..	Maxon Count Graceful
Maxon Count's Cora 2nd ..	Vol. 25	5.3.38	14	5,363	5·82	311·92	230	Jr. 2	.. ..	Maxon Count Graceful
Maxon Count's Pearl ..	45059	14.3.38	16	6,320	5·27	333·03	350	Mature	269, 342, 276	Maxon Count Graceful
Maxon Count's Ranunculus	58352	8.3.38	14	5,642	6·38	359·79	270	Jr. 3	321 ..	Maxon Count Graceful
Maxon Noble's Pansy 2nd..	54027	10.3.38	16	6,703	5·06	339·47	290	Sr. 3	248, 316 ..	Avalon Noble 8th
Maloney, P. J., Tongala, Jersey (1).										
Belgonia Junette 2nd ..	47152	1.1.38	18	7,583	5·54	420·12	290	Sr. 3	350, 399 ..	Duke of the Lake (Imp.
Mitchell, R. H., Linton, Jersey (2).										
Clifford Farm Belladonna ..	56817	9.2.38	28	9,231	5·31	489·95	330	Sr. 4	.. ..	Wompini V.C.
Clifford Farm Janice ..	Vol. 25	10.2.38	28	7,730	5·72	441·03	230	Jr. 2	.. ..	Wompini V.C.
Moore, J., and Co., Yarram, Jersey (16).										
Clarendon Eyre Camille 11th	56799	25.3.38	21½	6,672	5·04	336·20	270	Jr. 3	298 ..	Victorious Pioneer (Imp.)
Clarendon Eyre Rose Marie 12th	56810	20.3.38	12	4,374	5·24	229·10	270	Jr. 3	254 ..	Clarendon Eyre Oxford Gamboge
Tooloonook Boltonia 5th ..	46463	12.3.38	18½	5,502	4·32	237·90	350	Mature	316, 323, 283, 270	Tooloonook Clianthus Hero
Tooloonook Heather 4th ..	59755	5.3.38	20	6,368	4·82	307·24	330	Sr. 4	240, 312 ..	Tooloonook Plumbago's Hero
Tooloonook Molly 11th ..	59757	28.2.38	18½	5,475	4·90	268·52	270	Jr. 3	240 ..	Tooloonook Angler's Hero
Tooloonook Molly 12th ..	59758	26.2.38	16½	4,919	4·90	241·10	270	Jr. 3	256 ..	Anfield Diadem's Masterpiece
Tooloonook Molly 14th ..	C.R.	11.1.38	18	4,938	4·25	209·78	230	Jr. 2	.. ..	Tooloonook Carob's Hero
Tooloonook Peach 2nd ..	37958	12.3.38	28	7,377	3·93	290·16	350	Mature	298, 344, 443, 306	Heroic of Somerville
Tooloonook Peach 3rd ..	55573	28.2.38	16½	5,666	5·12	290·38	350	Mature	306, 314, 206, 293	Heroic of Somerville
Tooloonook Peach 8th ..	Vol. 25	1.3.38	12	4,277	5·34	228·34	230	Jr. 2	.. ..	Tooloonook Carob's Hero
Tooloonook Peach 9th ..	Vol. 25	14.3.38	14½	4,097	4·05	166·05	230	Jr. 2	.. ..	Anfield Diadem's Masterpiece
Tooloonook Plumbago 4th..	42249	2.3.38	14½	6,450	4·20	270·62	350	Mature	263, 311, 348, 288	Somerville Beauty 4th's Command
Tooloonook Sainfoin 3rd ..	50888	26.2.38	16½	5,244	5·00	262·33	350	Mature	245, 248 ..	Heroic of Somerville
Tooloonook Trixie 19th ..	Vol. 25	5.3.38	28½	7,185	4·15	298·51	330	Sr. 4	.. ..	His Majesty of Somerville
Tooloonook Virginia 2nd ..	46475	28.3.38	7½	4,481	4·62	206·89	350	Mature	178, 230, 333, 289, 338	Tooloonook Carob's Hero
Tooloonook Virginia 5th ..	Vol. 25	1.3.38	12	3,938	4·80	198·05	230	Jr. 2	.. ..	Heroic of Somerville

* 250 days in test.

Standard Herd Records—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Murdoch, J. and Son, Lismore, Jersey (1).										
Ismalia Petal	57782	9.3.38	15½	5,507	5·86	322·50	270	Jr. 3	217 ..	Murona Twylair
Nancarrow Bros., Kerang, Jersey (3).										
Pine Ridge Dream Girl ..	54753	5.2.38	9½	4,567	5·35	244·46	290	Sr. 3	327, 368 ..	Woodside Reprieve Volunteer
Pine Ridge Silvermine 4th	Vol. 25	28.12.37	19½	5,681	5·19	294·68	230	Jr. 2	.. ..	Duke of the Lake (Imp.)
Pine Ridge Wattle 2nd ..	59001	24.2.38	21½	6,320	5·14	324·76	270	Jr. 3	309 ..	Duke of the Lake (Imp.)
Nicholas, M. A., Sherbrooke, Jersey (1).										
Selsey Weigelia	55214	30.12.37	14	6,263	6·44	403·54	290	Sr. 3	295, 310 ..	Brampton Great Boy (Imp.)
Noble, T. M. and Sons, Maffra, Jersey (4).										
Finchley Canary 3rd ..	37992	19.2.38	25	8,532	6·08	518·59	350	Mature	354, 565, 509, 635, 549, 583	Werribee Lord Burnham
Finchley Lady Peerless 2nd	57278	16.1.38	18	6,235	6·32	393·79	250	Sr. 2	352 ..	Finchley Lord Harmony
Finchley Lillian	57279	19.2.38	18½	6,359	6·68	424·97	330	Sr. 4	421 ..	Werribee Lord Burnham
Finchley Vasilika 2nd ..	Vol. 25	14.3.38	26	6,876	5·47	376·42	230	Jr. 2	.. ..	Finchley Masterman
Payne, A. E. T., Lilydale, Guernsey (3).										
Yarraview Charmuse ..	6629	11.3.38	18½	6,702	5·74	384·60	230	Jr. 2	.. ..	Honoria's Benefactor (Imp.)
Yarraview Citron ..	3550	5.2.38	39½	12,115	5·47	663·15	350	Mature	345, 360 ..	Woodland Fleur-de-Lys
Yarraview Jennie ..	5172	17.1.38	23½	8,251	5·56	458·85	350	Mature	402, 481 ..	Camellia's Majestic of Maple Lodge (Imp.)
Phillips, J. H., Speewa, Jersey (1).										
Toolang Carnation ..	36998	18.1.38	16	7,388	4·54	335·53	350	Mature	392, 400, 272	Vanilla 2nd of Tavistock
Powell, T. S., Mansfield, Jersey (1).										
Monterey May's Fancy ..	58529	26.1.38	20	6,614	5·35	353·69	290	Sr. 3	304 ..	Roscliff Mariposa's Master
Read, J. D., Springhurst, Jersey (1).										
Springhurst Angelica Tomato	55264	27.3.38	24	7,178	5·04	362·07	250	Sr. 2	335 ..	Bellefaire Seaborn Successor
Richardson, W. S., Bacchus Marsh, Jersey (6).										
Clarendon Eyre Waltz Dream	33953	31.12.37	15	5,508	4·51	248·54	350	Mature	368, 452, 447, 494, 448, 384	Clarendon Eyre Eminent's Achievement
Sutton Lea Airmite ..	38135	31.12.37	14	5,925	4·81	285·07	350	Mature	294, 393, 345, 309, 387	Banyule Petalon 2nd
Sutton Lea Lu Lu ..	55361	14.2.38	11	4,338	5·15	223·26	310	Jr. 4	232, 248 ..	Sutton Lea Garnap
Sutton Lea Molly ..	Vol. 25	5.3.38	10½	4,554	4·91	223·72	230	Jr. 2	.. ..	Staghorn Prince Aldan
Sutton Lea Pariel 5th ..	Vol. 25	14.3.38	12½	3,863	4·74	183·07	230	Jr. 2	.. ..	Staghorn Prince Aldan
Sutton Lea Petal ..	46286	30.12.37	15	4,765	6·08	289·71	350	Mature	261, 272, 326	Banyule Petalon 2nd
Ronalds, O., Tarago, Jersey (1).										
Jindivick Empress ..	48873	6.3.38	23	9,494	5·13	487·04	330	Sr. 4	370 ..	Somerville Master Babs
Salesian College, Sunbury, Friesian (4).										
Ingolston Bonnie Bess ..	4090	1.1.38	14	9,954	3·44	342·83	350	Mature	258, 307, 305, 439	Greenvale Ideal Segis
Ingolston Domino's Beauty	3528	8.2.38	30	16,793	3·58	600·43	350	Mature	387, 341, 578	Ingolston Dutch Domino
Ingolston Ena	4093	20.3.38	16	14,720	3·18	467·84	350	Mature	281, 384 ..	Greenvale Ideal Segis
Ingolston Madge ..	4097	17.3.38	14½	14,564	3·62	526·89	350	Mature	379, 368, 478	Awapuna Dutchman
Shearman, A. and W., Darnum, Jersey (2).										
Darnum Park Molly Haha	Vol. 25	15.2.38	28½	7,189	4·57	328·67	350	Mature	346, 331 ..	Master Clement of Glen Iris
*Darnum Park Sweet Rose	Vol. 25	9.1.38	4	3,098	5·51	170·73	270	Jr. 3	284 ..	Darnum Park Starbright's Masterpiece
Steel, R. G., Tandarra, Dairy Shorthorn (1).										
Hillcrest Pet 45th ..	D.S.H.B.	7.3.38	5½	5,433	3·95	214·71	350	Mature	.. ..	Willow Park Renown
Stephen, Dr. F. G., Vermont, Guernsey (2).										
Una of Maple Lodge (Imp.)	5186	15.1.38	35	9,059	4·31	390·44	350	Mature	307, 413 ..	Sunrise of Maple Lodge
Roads End Antionette ..	3409	5.2.38	13	7,088	4·79	339·76	350	Mature	398 ..	Glenburnie Ideal (Imp.)
Stoney, W. B., Drouin West, Jersey (2).										
Tarago Foxglove 5th ..	59629	22.1.38	12	4,241	5·31	224·99	270	Jr. 3	181 ..	Tarago Handsome Boy
Tarago Wildflower 2nd ..	50771	21.1.38	7½	3,665	6·32	231·48	330	Sr. 4	216 ..	Edmonton Island Chief
Tomasetti, B. G., Drouin West, Ayrshire (1).										
Glencorren Margaret ..	28446	28.12.37	21	8,274	4·22	349·37	350	Mature	303, 315 ..	Scotswood Michael 2nd
Trewin, J. V., Nathalia, Jersey (1).										
Weir View Golden Ideal ..	59970	11.3.38	21	5,271	5·44	286·68	230	Jr. 2	.. ..	Maiwand Ideal 2nd
Vaughan Bros., Girgarre, Jersey (1).										
Lynroy Graceful	58250	29.12.37	33	8,936	5·40	482·42	350	Mature	294, 566, 523	Sherborne Wyandotte's King

* 180 days in test.

STANDARD HERD RECORDS—*continued.*

Name of Cow.	Herd Book No.	Date of Calving.	Milk last day of Test. lb.	Milk. lb.	Average Test.	Butter Fat. lb.	Standard required.	Class.	Previous Yields of Butter Fat.	Sire.
Wade, W. J., Stratford, Jersey (1).										
Inverbroom Ruby's Bunty 2nd	Vol. 25	28.12.37	16½	4,625	4·82	222·89	230	Jr. 2	.. ..	Grangelea Butter Boy 3rd
Walker, C. S., Swan Hill, Friesian (4).										
Warwick Leonora Walker	Vol. 14	5.3.38	36	12,083	2·89	348·75	270	Jr. 3	259 ..	Hengest Matador Walker
Warwick Maggie Walker ..	Vol. 14	4.1.38	34	11,262	3·40	383·09	310	Jr. 4	272 ..	Hengest Segis Lizzie
Warwick Maggie Woodcrest	Vol. 14	26.2.38	19	13,014	3·03	394·04	330	Sr. 4	265, 352 ..	Greenvale Woodcrest Oakwood 2nd
Warwick Violet Oakwood	Vol. 14	15.1.38	35	10,700	3·42	365·75	310	Jr. 4	.. ..	Greenvale Woodcrest Oakwood 2nd
Walker, C. S., Swan Hill, Jersey (1).										
Grangelea Golden 5th ..	C.R.	13.3.38	15	4,509	5·57	251·02	230	Jr. 2	.. ..	Grangelea Prosper 5th
Warragul High School, Warragul, Red Poll (1).										
Gipps Christina	2874A	8.2.38	9½	5,429	4·68	254·18	350	Mature	250, 220, 358, 300, 240	Woodburn Laureate
Watson, K. E., Pakenham Upper, Jersey (4).										
Goronga Farm Daffodil Octavia	44162	31.1.38	16	5,657	4·54	256·78	350	Mature	320, 334, 277	Banyule Air Gun
Goronga Farm Larkspur's Airofoil	Vol. 25	8·2·38	18	5,001	5·07	253·33	230	Jr. 2	.. ..	Werribee Alanda
Goronga Farm Larkspur's Daffodil	Vol. 25	1.2.38	16½	4,193	5·70	238·90	230	Jr. 2	... ..	Werribee Alanda
Goronga Farm Soubrette ..	Vol. 25	29.1.38	17½	4,583	5·09	233·24	230	Jr. 2	.. ..	Somerville Reputed King
Wilson, A., Port Fairy, Ayrshire (3).										
Carracoorte Bunty 27th ..	29204	20.3.38	23	9,125	3·86	352·28	270	Jr. 3	249 ..	Carracoorte Boomerang
Carracoorte Iris 26th ..	29209	6.3.38	18	5,962	3·87	231 04	310	Jr. 4	221 ..	Grand View Bernie
Green Vale Rosebloom 6th	28555	20.3.38	22	7,620	4·51	343·33	350	Mature	307 ..	Carracoorte Squire

Tubercle Free Herds

The following herds have been declared free of tuberculosis under the scheme conducted by the Department of Agriculture. Under this scheme a tuberculosis-free accredited herd of cattle is one in which the entire herd has passed two negative, successive, annual physical examinations and tuberculin tests, or, upon disclosure of infection, three semi-annual, successive physical examinations and tuberculin tests applied by a State Veterinarian or by a qualified and registered veterinarian who is approved by the Chief Veterinary Inspector for that purpose.

ACCREDITED TUBERCLE FREE HERDS.

Herd Number.	Name.	Address.	Number in Herd.	Herd Number.	Name.	Address.	Number in Herd.
1	State Research Farm	Werribee ..	190	10	Banyule Stud Pty. Ltd.	Heidelberg ..	122
2	Warragul High School	Warragul ..	35	11	McIntosh, John ..	"Burnwood," Merrigum	31
3	Payne, A. E. T. ..	"Yarra View," Lilydale	80	12	Black, Mrs. Agnes ..	Mount Noorat	40
4	Dennis, Mrs. A. A. ..	Frankston ..	14	13	Black, Estate, Late I. S.	"The Cottage," Mount Noorat	44
5	Lady Talbot Milk Supply Company	Cranbourne ..	418	14	Read, John D. ..	"Springhurst Estate," Springhurst	99
6	Reid, Ralph G. ..	"Holmwood," Koo-wee-rup	99	15	Kelly, C. ..	"Glenmore," Creighton's Creek, Euroa	22
7	Harris, J. W. ..	"Rowena," Clyde	72	16	Gorman, A. W. ..	"Cathcart," Alexandra	57
8	School of Horticulture	Burnley ..	8	17	Samuel, B. T. ..	Lang Lang ..	72
9	Lawrence, P. H. ..	"Rainga," Tarrawarra	59				

All-Australian Export Lamb Competition

October Entries Judged

THE following report on entries in the All-Australian Export Lamb Competition for October, which were judged at the Central Markets, Smithfield, London, on 10th January, 1939, by Mr. J. I. Hamilton, has been received from the Australian Meat Board's London Office. Twenty-eight pens of five carcasses each were entered. The placings were as follows :—

Placing.	Entrant.	State.	Remarks.
CLASS I.—27 ENTRIES.—Lambs sired by Southdown, Dorset Down, Hampshire Down, or Shropshire Rams.			
1st	H. S. Henley, "Bassett Downs," Cowra	New South Wales	Southdown x Romney-Merino. Five exceptionally good carcasses, ideal from the butcher's viewpoint, well shaped, full fleshed with a minimum of waste.
2nd	R. B. Mills & Son, "Clifton", Nullawil	Victoria	Southdown x English Leicester-Comeback. Very little inferior to the first pen in suitability of type. A single carcass from this pen was selected for a special block test as the best in the competition.
Equal 3rd	R. B. Mills & Son, "Clifton", Nullawil	Victoria	Southdown x English Leicester-Comeback. A good even pen of well shaped lambs but showing some weakness in the crutch.
	T. Ridgway, Martin-avenue, Fitzroy	South Australia	Southdown x Romney-Merino. Three well balanced, shapely carcasses of the true Down type, characterized by good depth of meat and absence of waste; two lacking in finish and weak in the crutch.
CLASS II.—1 ENTRY.—Lambs sired by Ryeland, Suffolk, or Dorset Horn Rams.			
	A. E. Day, "Allendale", Alma	South Australia	Suffolk, Merino. Five plain carcasses with no outstanding feature.

For the first time in the present series the leading pen was not bred from Dorset Horn-Merinos.

The standard of the first fourteen entries was fully up to that of the same number in the previous Competition, but thereafter they fell away.

An imposing display, by Messrs. Weddel & Co., of 480 Waikato Agricultural and Pastoral Association show lambs afforded an excellent opportunity for comparing New Zealand and Australian lambs, and except that the New Zealand lambs were lighter and perhaps included less wasteful carcasses, the leading Australian pens suffered little indeed by comparison. In fact, some authorities expressed the opinion that three carcasses out of each of the ten leading Australian pens could have been picked to beat the winning New Zealand pens, each of which comprised only three carcasses.

The Western Australian lambs, while not being outstanding, were again remarkable for their even, useful quality.

H. J. GREEN, Government Printer, Melbourne.

NATIONAL MUSEUM OF VICTORIA

List of Stock Foods and Stock Licks

Registered at the Office of the Director of Agriculture under the Stock Foods Act 1936, No. 4382, for the Year 1939.

Distinguishing Brand Name.	Guaranteed Composition. Crude Protein (N × 6·25). Minimum	Crude Fat. Minimum	Crude Fibre. Maximum	Where Obtainable.
	%	%	%	
CONCENTRATED STOCK FOODS.				
Dried Blood Meal.				
M.C.C. Blood Meal	72·0	1·0	5·0	Melbourne City Council, Town Hall, Melbourne
Imperial Blood	75·0	..	5·0	W. Angliss and Co. (Aust.) Pty. Ltd., 42 Bourke-street, Melbourne
Brooklyn, T.B. and S. in diamond	75·0	..	5·0	Thos. Borthwick and Sons (A'asia) Ltd., 84 William-street, Melbourne
Clark's	65·0	..	5·0	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
Champion	75·0	..	5·0	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Meat Meal.				
M.C.C. Meat Meal	63·0	10·0	5·0	Melbourne City Council, Town Hall, Melbourne
M.C.C. (with bone)	57·0	10·0	5·00	Melbourne City Council, Town Hall, Melbourne
T.B. and S. in Diamond Brooklyn Meat Meal, No. 1	58·0	12·0	3·0	Thos. Borthwick and Sons (A'asia) Ltd., 84 William-street, Melbourne
Brooklyn No. 2	54·0	12·0	3·00	Thos. Borthwick and Sons (A'asia) Ltd., 84 William-street, Melbourne
Cal-phoric Meat Meal	52·0	12·0	1·0	Mulgrave By-Products Co., North-road, East Oakleigh
Apex Meat Meal	50·0	7·2	2·0	North-Eastern Bone Products, Wangaratta
Champion Meat Meal	50·0	12·0	2·0	Sims Cooper (Freezing Works) Pty. Ltd., 499 Little Collins-street, Melbourne
Cockbill's Meat Meal	48·0	10·0	1·0	W. and J. Cockbill, Footscray-road, Footscray
Dandy Meat Meal	50·0	12·0	1·5	Gippsland Co-op. Bacon Curing Co. Ltd., Dandenong
Apollo Meat Meal	43·0	8·0	1·0	J. Kitchen and Sons Pty. Ltd., Ingles-street, Port Melbourne
J.K.S.	45·0	10·0	2·00	J. Kitchen and Sons Pty. Ltd., Ingles-street, Port Melbourne
Pridham's Meat Meal	53·00	12·00	1·0	W. Pridham Pty. Ltd., Evans-street, Braybrook
Imperial Meat Meal	60·00	9·00	2·0	W. Angliss and Co. (Aust.) Pty. Ltd., 42 Bourke-street, Melbourne
Imperial Liver Meal	63·00	18·00	..	W. Angliss and Co. (Aust.) Pty. Ltd., 42 Bourke-street, Melbourne
Imperial Bovina	48·0	8·0	1·00	W. Angliss and Co. (Aust.) Pty. Ltd., 42 Bourke-street, Melbourne
Excelsior Meat Extract Meal	40·00	10·00	..	Rowcroft Bros., 123 William-street, Melbourne
Arch No. 1 (Ballarat)	45·0	12·0	2·0	Amalgamated Freezing Co. (Vic.) Pty. Ltd., 54 Market-street, Melbourne
Clark's Vitabeef	52·0	12·0	2·00	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
Mercury	55·0	12·0	1·00	H. C. Sleigh, 582 Little Collins-street, Melbourne
Bovaline	68·0	5·0	4·00	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Pannifex "Best"	40·0	8·0	3·00	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Pannifex Special	50·0	5·0	3·00	Pannifex & Co. Pty. Ltd., 4 Dudley-street, Melbourne
*Woolmex	28·0	4·2	3·00	J. Kitchen and Sons Pty. Ltd., Ingles-street, Port Melbourne
PREPARED STOCK FOODS.				
Milk Products.				
Krafco	10·0	·5	..	Kraft Walker Cheese Co. Pty. Ltd., Riverside-avenue, South Melbourne
Kraftone	10·0	·5	..	Kraft Walker Cheese Co. Pty. Ltd., Riverside-avenue, South Melbourne
Rising Sun Buttermilk Powder	35·0	5·0	..	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
Maffco ,, ,,	30·0	5·0	..	Maffra Co-op. Milk Products Co. Ltd., Maffra
K.B.F. ,, ,,	32·0	6·0	..	Korumburra and District Co.-op. Butter Factory and Trading Co. Ltd., Korumburra
Allansford ,, ,,	30·3	7·0	..	Warrnambool Cheese and Butter Factory Co. Ltd., Allansford
Clark's Vitamilk	31·0	6·0	1·0	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
Lacfos	14·0	..	..	Clark, King and Co. Pty. Ltd., 237 Queen-street, Melbourne

* Contains 30 per cent. of salt.

LIST OF STOCK FOODS AND STOCK LICKS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE STOCK FOODS ACT 1936, No. 4332, FOR THE YEAR 1939—*continued.*

Distinguishing Brand Name.	Guaranteed Composition.			Where Obtainable.
	Crude Protein (N × 6·25). Minimum	Crude Fat. Minimum	Crude Fibre. Maximum	
PREPARED STOCK FOODS—*continued.*	%	%	%	
Oil-Seed or Cake Meals and Nuts.				
Eta Peanut Meal	48·0	1·5	6·0	Nut Foods Pty. Ltd., 544 Lonsdale-street, Melbourne
Linseed Meal	16·6	30·0	9·3	Lyall and Sons Pty. Ltd., 39 Leveson-street, North Melbourne
Meggitt's Linseed Oil-cake Meal, M.L.M.	28·0	6·0	10·0	Meggitt Ltd., Hobsons-road, South Kensington
Meggitt's Linseed Sheep Nuts, M.L.M.	28·0	6·0	10·0	Meggitt Ltd., Hobsons-road, South Kensington
Sunlight Oil-cake	20·0	5·5	6·5	Lever Bros. Pty. Ltd., 565 Flinders-lane, Melbourne
Key Meal	20·0	5·5	6·5	Lever Bros. Pty. Ltd., 565 Flinders-lane, Melbourne
Eta Cocoanut Meal	19·0	7·0	9·0	Nut Foods Pty. Ltd., 544 Lonsdale-street, Melbourne
Barnes Linseed Sheep Nuts	10·0	6·0	10·0	Robert Nelson and Co., 528 Collins-st., Melbourne
"Halmeg" Linseed Meal	31·7	2·8	13·0	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
"Halmeg" Sheep Nuts	28·4	2·6	13·0	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
MIXED STOCK FOODS.				
Codlivine	17·0	17·0	8·0	Osmond and Sons (Aust.) Pty. Ltd., 35 William-street, Melbourne
Codlivine (Poultry)	17·0	17·0	8·0	Osmond and Sons (Aust.) Pty. Ltd., 35 William-street, Melbourne
Codlivine (Pigs)	18·0	16·0	8·0	Osmond and Sons (Aust.) Pty. Ltd., 35 William-street, Melbourne
Harpers Star Calf Food	12·0	15·0	6·0	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
Parsons Calf Food	11·5	14·0	6·5	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Hocking's Calf Food	11·1	2·8	3·4	J. Hocking and Sons Pty. Ltd., 243 Dandenong-road, East Malvern
Lyall's Calf Food	10·5	4·2	3·0	Lyall and Sons Pty. Ltd., 39 Leveson-street, North Melbourne
Ayrshire Calf Food	13·30	2·45	4·0	James Railton, 133 Elizabeth-street, Melbourne
Ward's Calf Food	9·0	3·0	7·0	H. S. K. Ward Pty. Ltd., 24–38 Spencer-street, Melbourne
Hocking's Growing Mash	14·07	5·9	5 2	J. Hocking and Sons Pty. Ltd., 243 Dandenong-road, East Malvern
Hocking's Laying Mash	14·05	4·5	4·2	J. Hocking and Sons Pty. Ltd., 243 Dandenong-road, East Malvern
White's Laying Mash	15·0	2·5	8·0	White, Hancock, and Mills Pty. Ltd., 296–306 City-road, South Melbourne
Ward's Chick Meal	10·0	4·0	5·0	H. S. K. Ward Pty. Ltd., 24–38 Spencer-street, Melbourne
Lyall's Laying Mash	13·6	4·3	7·3	Lyall and Sons Pty. Ltd., 39 Leveson-street, North Melbourne
Lyall's Werribee Mash	8·4	3·0	6·0	Lyall and Sons Pty. Ltd., 39 Leveson-street, North Melbourne
Lyall's Growing Mash	9·0	3·4	7·0	Lyall and Sons Pty. Ltd., 39 Leveson-street, North Melbourne
Harper's Star Chick Flakes	10·0	9·0	5·0	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
Harper's Star Chick Food	10·0	8·5	5·0	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
Clark's Laying Mash	19·0	6·0	6·0	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
Clark's Growing Mash	16·0	7·0	6·0	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
Clark's Werribee Meal	13·0	4·0	5·0	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
Clark's Eggoleen	42·0	12·0	3·0	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
Clark's Chick-starter	16·0	7·0	6·0	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
Taylors National Calf Food	13·5	6·5	5·5	National Cattle and Poultry Food Co., 64A King-street, Melbourne
Baird's Laying Mash	15·0	5·0	6·0	G. W. and H. P. Baird Pty. Ltd., 15–33 Queens-parade, Clifton Hill
Baird's Growing Mash	13·5	4·5	5·0	G. W. and H. P. Baird Pty. Ltd., 15–33 Queens-parade, Clifton Hill
Warragul Laying Mash	14·05	4·5	4·2	Warragul Egg Circle, Warragul
Warragul Growing Mash	14·07	5·9	5·2	Warragul Egg Circle, Warragul
Vita-lick Pig Mixture (V.P.M.)*	13·2	1·8	3·2	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita-lick Mineral Mixture (V.M.M.)*	7·7	7·8	3·1	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Kaf-o-Vite	14·3	12·3	5·6	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
P & F Growing Mash	16·0	4·0	6·0	Poultrymen and Farmers' Trading Co., 280–286 Queensberry-street, North Melbourne
P and F Competition Laying Mash	18 0	5·5	5·0	Poultrymen and Farmers' Trading Co., 280–286 Queensberry-street, North Melbourne
P & F Werribee Mixture	11·0	3·5	4·5	Poultrymen and Farmers' Trading Co., 280–286 Queensberry-street, North Melbourne
Vita-Pro-Teen	9·62	4·18	10·0	D. G. Officer Pty. Ltd., 90 William-street, Melbourne
Allkon "Protovite"	30·0	6·5	7·0	Allkon Pty. Ltd., 36 Clarendon-street, South Melbourne

* Contains minerals—phosphates, &c.

LIST OF STOCK FOODS AND STOCK LICKS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE STOCK FOODS ACT 1936, No. 4382, FOR THE YEAR 1939—*continued.*

Distinguishing Brand Name.	Guaranteed Composition.			Where Obtainable.
	Crude Protein (N × 6·25). Minimum	Crude Fat. Minimum	Crude Fibre. Maximum	
MIXED STOCK FOODS—*continued.*	%	%	%	
Harper's Prepared Grain (Poultry) ..	9·0	9·0	4·50	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
Mormilk "A"	31·7	2·8	13·0	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Mormilk "B"	35·0	3·5	10·5	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Mormilk "C"	40·0	4·0	8·0	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Wilmo Stock Food	15·5	8·0	15·5	Wilcox Mofflin Ltd., Henty House, Little Collins-street, Melbourne
A.H.P. Nut Meal	24·0	6·0	10·0	New Zealand Loan and Mercantile Agency Co. Ltd., 538–544 Collins-street, Melbourne
A.H.P. Sheep Nuts	24·0	6·0	10·0	New Zealand Loan and Mercantile Agency Co. Ltd., 538–544 Collins-street, Melbourne
Meggitt's New Linseed-balanced Sheep Nuts	18·0	4·0	6·0	Meggitt Ltd., Hobson's-road, South Kensington, Victoria
Welco Codovite	30·0	6·5	7·0	Welch, Perrin and Co. Pty. Ltd., 48–56 Queenbridge-street, South Melbourne
Barastoc Ewe and Lamb Cubes ..	21·0	5·0	6·5	Barastoc Products, 422 Collins-street, Melbourne
Barastoc Calf Pellets..	19·0	4·5	6·0	Barastoc Products, 422 Collins-street, Melbourne
Barastoc Dairy Cow Cubes	18·5	4·5	8·0	Barastoc Products, 422 Collins-street, Melbourne
Barastoc Poultry Pellets	17·0	5·0	6·0	Barastoc Products, 422 Collins-street, Melbourne
Barastoc Sheep Maintenance Cubes ..	14·5	3·5	7·0	Barastoc Products, 422 Collins-street, Melbourne
Barastoc Pig Fattening Cubes ..	14·0	3·0	4·5	Barastoc Products, 422 Collins-street, Melbourne
Carisbrook Chick Food	15·84	2·98	5·23	S. Cole and Son, Majorca-road, Carisbrook
Velox Calf Food	14·6	2·9	4·0	J. Sinclair and Co., Portarlington
Clark's Calf Food	18·0	5·0	4·0	Clark, King and Co. Pty. Ltd., Queen-street, Melbourne
Barkla's Growing Mash	11·5	3·5	3·8	R. E. Barkla, Joyce's Creek
WHEAT AND WHEAT BY-PRODUCTS.				
Hocking's Wheat Meal	12·35	3·0	3·6	J. Hocking and Sons Pty. Ltd., 243 Dandenong-road, East Malvern
Lyall's Wheat Meal	8·20	2·7	3·3	Lyall and Sons Pty. Ltd., 39 Leveson-street, North Melbourne
Clark's Wheat Meal	9·00	1·0	3·0	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
Baird's Wheat Meal	10·90	2·3	2·5	G. W. and H. P. Baird Pty. Ltd., 15–33 Queens-parade, Clifton Hill
P & F Wheat Meal	11·5	3·0	2·5	Poultrymen and Farmers' Trading Co., 280 Queensberry-street, North Melbourne
Barkla's Wheat Meal	10·3	1·3	2·8	R. E. Barkla, Joyce's Creek
Pro-Vita Stock Food	29·5	10·0	2·5	Pro-Vita Mills (Aust.) Ltd., 422 Collins-street, Melbourne
Processed Rolled Wheat	10·0	2·0	3·0	Hutchinson's Finley Flour Milling and Agency Co. Pty. Ltd., Glenroy
BRAN AND POLLARD.				
The following firms have registered distinguishing brand names for Brant and Pollard‡:—				
Barwon Flour Mills	..	..	..	40 Little Malop-street, Geelong
Brunton and Co. Pty. Ltd. ..	..	..	..	531 Collins-street, Melbourne, and Rupanyup
Burnley Flour Mills Pty. Ltd. ..	..	..	..	376 Swan-street, Burnley
Burrows, John, Pty. Ltd. ..	..	..	..	Albury, New South Wales
Corowa Milling Co. Ltd.	..	..	..	Corowa, New South Wales
Darling (John) and Son	..	..	..	44 King-street, Melbourne
Echuca Flour Mills Pty. Ltd. ..	..	..	..	Echuca
Garden City Flour Milling Co. Pty. Ltd.	..	..	..	Trench-street, Ballarat
Grant and Wilson Pty. Ltd. ..	..	..	..	McNally-street, Yarrawonga
Kimpton (W. S.) and Sons ..	..	..	..	422 Collins-street, Melbourne
Malcolm (James) and Co. Pty. Ltd.	..	..	..	St. Arnaud
Maryborough Flour Mills Pty. Ltd...	..	..	..	Maryborough
McLennan and Co. Pty. Ltd. ..	..	..	..	Mooroopna
Miniffe (James) and Co.	..	..	..	422 Collins-street, Melbourne
Noske Bros. Pty. Ltd.	..	..	..	108 Queen-street, Melbourne, Horsham, Nhill and Charlton
Schutt and Barrie Pty. Ltd. ..	..	..	..	Geelong-road, West Footscray
Silver Lake Flour Milling Co. ..	..	..	..	Sale
Smith (W. and P.)	..	..	..	35 Cusack-street, Wangaratta
Stratton and Co. Pty. Ltd. ..	..	..	..	68 Lulie-street, Abbotsford
Sunraysia Flour Mills Pty. Ltd. ..	..	..	..	Mildura
The Tooronga Milling Co. Pty. Ltd.	..	..	..	463 Auburn-road, Hawthorn, Melbourne
Thomas (W. C.) and Sons Pty. Ltd.	..	..	..	55 William-street, Melbourne
Tomlins, Simmie and Co. Pty. Ltd..	..	..	..	Bendigo and Richmond
Wangaratta Flour Mills Co. Pty. Ltd	..	..	..	Wangaratta and Wahgunyah
Willis Bros.	..	..	..	Kyneton

LIST OF STOCK FOODS AND STOCK LICKS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE STOCK FOODS ACT 1936, No. 4382, FOR THE YEAR 1939—*continued.*

Distinguishing Brand Name.	Guaranteed Composition.			Where Obtainable.
	Crude Protein ($N \times 6{\cdot}25$). Minimum.	Crude Fat. Minimum.	Crude Fibre. Maximum.	
BRAN AND POLLARD—*continued.*	%	%	%	
Wimmera Flour Mill Co. Pty. Ltd...	..	..	..	Stawell
Water and Kerang United Roller Mills Ltd.	..	..	..	Bridgewater and Kerang
Wise Bros.	..	..	..	Tocumwal
Jackett and Sons	..	..	..	534 Bridge-road, Richmond
Hudson and Co. Pty. Ltd. (Bran only)	..	..	..	631–5 Church-street, Richmond
† The 1939 Chemical Standard for Bran is	15·5	2·5	10·0	
‡ The 1939 Chemical Standard for Pollard is	15·5	3·0	6·25	
OAT PRODUCTS.				
Parson's No. 1 Oat Branning	10·00	6·75	16·0	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Parson's No. 2 Oat Branning	7·50	5·75	15·25	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Harper's Star Oat Branning	8·50	6·00	25·00	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
Parson's No. 2 Oat Screenings ..	8·50	5·50	13·25	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Parson's No. 3 Oat Screenings ..	7·00	5·00	21·25	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Fleming's Light Branning	8·50	5·50	25·00	Fleming and Co. (Aust.) Pty. Ltd., Sunbury-road, Footscray
Ward's Oat Branning	6·00	4·00	25·00	H. S. K. Ward Pty. Ltd., 24–38 Spencer-street, Melbourne
Connell's Oat Branning	11·30	8·50	14·00	John Connell and Co. Ltd., 578 Bourke-street, Melbourne
Connell's Oat Pollard	11·80	9·00	2·00	John Connell and Co. Ltd., 578 Bourke-street, Melbourne
Lyall's Oat Meal	9·60	7·00	7·00	Lyall and Sons Pty. Ltd., 39 Leveson-street, North Melbourne
Hocking's Oat Pollard	12·56	5·10	3·90	J. Hocking and Sons Pty. Ltd., 243 Dandenong-road, East Malvern
Clark's Oat Pollard	12·00	7·00	5·00	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
McKenzie's Oat Pollard	10·00	8·00	5·00	J. F. McKenzie and Co. Pty. Ltd., 192 Arden-street, North Melbourne
McKenzie's Oat Branning	7·00	4·00	20·00	J. F. McKenzie and Co. Pty. Ltd., 192 Arden-street, North Melbourne
P & F Oaten Meal	12 0	8·0	4·0	Poultrymen and Farmers' Trading Co., 280 Queensberry-street, North Melbourne
BARLEY PRODUCTS.				
Harper's Star Barley Meal	14·5	5·50	2·5	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
Ward's Barley Meal	10·0	4·00	10·0	H. S. K. Ward Pty. Ltd., 24–38 Spencer-street, Melbourne
Lyall's Barley Meal	9·2	2·40	4·3	Lyall and Sons Pty. Ltd., 39 Leveson-street, North Melbourne
Connell's Barley Meal	10·4	4·50	3·0	John Connell and Co. Ltd., 578 Bourke-street, Melbourne
Connell's Barley Branning	10·4	6·00	9·0	John Connell and Co. Ltd., 578 Bourke-street, Melbourne
Harper's Star Barley Branning ..	14·0	6·50	3·0	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
Parson's Barley and Oat Pollard ..	11·0	5·50	10·0	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Lyall's Barley and Oat Meal ..	9·3	4·30	7·0	Lyall and Sons Pty. Ltd., 39 Leveson-street, North Melbourne
McKenzie's Barley Pollard	12·0	3·00	20·0	J. F. McKenzie and Co. Pty. Ltd., 192 Arden-street, North Melbourne
P & F Barley Meal	10·0	3·0	5·0	Poultrymen and Farmers' Trading Co., 280 Queensberry-street, North Melbourne
Lyall's Barley and Wheat Meal ..	10·0	2·4	4·5	Lyall and Sons Pty. Ltd., Leveson-street, North Melbourne
RICE PRODUCTS.				
Harper's Rice Bran	5·0	6·0	40·0	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
Harper's Star White Rice Meal ..	10·0	12·5	8·5	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
Harper's Star Brown Rice Meal ..	10·0	17·0	9·0	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
Parson's Rice Meal	10·0	19·0	9·5	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
McKenzie's Rice Pollard	10·0	15·0	8·0	J. F. McKenzie and Co. Pty. Ltd., 192 Arden-street, North Melbourne

LIST OF STOCK FOODS AND STOCK LICKS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE STOCK FOODS ACT 1936, No. 4382, FOR THE YEAR 1939—*continued.*

Distinguishing Brand Name.	Guaranteed Composition.			Where Obtainable.
	Crude Protein (N × 6·25). Minimum	Crude Fat. Minimum	Crude Fibre. Maximum	
	%	%	%	
MAIZE PRODUCTS.				
Polly Gluten Feed	23·0	3·0	9·0	Maize Products Pty. Ltd., corner Parker and Maribyrnong streets, Footscray
Hocking's Maize Meal	8·25	4·25	3·5	J. Hocking and Sons Pty. Ltd., 243 Dandenong-road, East Malvern
Ward's Maize Meal	7·0	3·0	4·0	H. S. K. Ward Pty. Ltd., 24–38 Spencer-street, Melbourne
Lyall's Maize Meal	7·67	3·2	2·0	Lyall and Sons Pty. Ltd., 39 Leveson-street, North Melbourne
Maize Oil Meal	16·0	12·0	10·0	Maize Products Pty. Ltd., corner Parker and Maribyrnong streets, Footscray
Parson's Wet Maize Bran	3·0	1·0	2·0	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Clark's Maize Meal	7·0	3·0	3·0	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
P. and F. Maize Meal	9·0	4·0	3·0	Poultrymen and Farmers' Trading Co., 280–286 Queensberry-street, North Melbourne
PEA PRODUCTS.				
Parson's Pea Meal	16·00	1·50	18·75	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Hocking's Pea Meal	17·55	2·20	12·95	J. Hocking and Sons Pty. Ltd., 243 Dandenong-road, East Malvern
Ward's Pea Meal	14·00	1·00	18·00	H. S. K. Ward Pty. Ltd., 24–38 Spencer-street, Melbourne
Harper's Whole Pea Screenings	18·5	1·00	6·0	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
Harper's Split Pea Screenings	15·00	1·00	5·00	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
Parsons Pea Screenings	16·25	1·00	6·00	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Clark's Pea Meal	18·00	1·00	15·00	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
McKenzie's Pea Pollard	20·0	1·00	10·0	J. F. McKenzie and Co. Pty. Ltd., 192 Arden-street, North Melbourne
Lyall's Pea Meal	13·50	3·60	31·0	Lyall and Sons Pty. Ltd., 39–51 Leveson-street, North Melbourne
HULLS.				
Parson's Barley Hulls	2·50	·60	39·75	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
McKenzie's Pea Hulls	6·00	·50	40·00	J. F. McKenzie and Co. Pty. Ltd., 192 Arden-street, North Melbourne
Parson's Pea Hulls	3·50	·40	46·25	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Parson's Oat Hulls (A)	1·25	·40	40·75	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Parson's Oat Hulls (B)	4·25	3·00	30·00	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Parson's Oat Hulls (C)	5·00	1·25	34·00	Parsons Bros. and Co. Pty. Ltd., 554–562 Flinders-lane, Melbourne
Ward's Barley Hulls	2·00	·80	32·00	H. S. K. Ward Pty. Ltd., 24–38 Spencer street, Melbourne
Ward's Pea Hulls	5·00	·25	40·00	H. S. K. Ward Pty. Ltd., 24–38 Spencer street, Melbourne
Ward's Oat Hulls	1·50	·70	35·00	H. S. K. Ward Pty. Ltd., 24–38 Spencer-street, Melbourne
Connell's Barley Hulls	5·00	·25	18·00	John Connell and Co. Ltd., 578 Bourke-street, Melbourne
Connell's Oat Hulls	·50	·50	35·00	John Connell and Co. Ltd., 578 Bourke-street, Melbourne
Fleming's Oat Hulls	2·00	1·00	32·50	Fleming and Co. (Aust.) Pty. Ltd., Bunbury-road, West Footscray
Harper's Oat Hulls	1·75	·70	35·0	Robert Harper and Co. Ltd., 390 Flinders-lane, Melbourne
McKenzie's Oat Hulls	1·50	1·00	35·00	J. F. McKenzie and Co. Pty. Ltd., 192 Arden-street, North Melbourne
MISCELLANEOUS.				
Lucerne Meal	12·3	2·4	25·00	Lyall and Sons Pty. Ltd., 39 Leveson-street, North Melbourne
Seed Meal	41·98	4·23	12·64	A. L. Thompson Pty. Ltd., 49–65 Grant-street, South Melbourne
Bakehouse Sweepings	2·0	2·0	2·0	Swallow and Ariel Ltd., 60 Stokes-street, Port Melbourne
Biscuit Sweepings	2·0	2·0	2·0	Swallow and Ariel Ltd., 60 Stokes-street, Port Melbourne

LIST OF STOCK FOODS AND STOCK LICKS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE STOCK FOODS ACT 1936, No. 4382, FOR THE YEAR 1939—*continued.*

Distinguishing Brand Name.	Guaranteed Composition.							Where Obtainable.
	Salt.	Phosphoric Acid.	Lime.	Magnesia.	Iron. (as Fe_2O_3).	Sulphur.	Iodine.	
	% (Max.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	
Stock Licks.								
Common Salt.								
"Lepp" Salt Lick	100·0	..	..	..	..	..	..	J. S. Corden and Co. (Vic.) Pty. Ltd., 44–54 Spencer-street, Melbourne
Cresco Salt Lick, 100 per cent. ..	100·0	..	..	..	..	..	..	Cresco Fertilizers Ltd., Geelong
Ram Salt Lick, 100 per cent. ..	100·0	..	..	..	..	..	..	Cheetham Salt Pty. Ltd., 71 Little Malop-street, Geelong
C.F.C. Stock Salt, 100 per cent.	100·0	..	..	..	..	..	..	Commonwealth Fertilizers and Chemicals Ltd., 65 William-street, Melbourne
Ram-Lic	97·0	..	..	..	..	3·0	..	Cheetham Salt Pty. Ltd., 71 Little Malop-street, Geelong
I.C.L. Stock Salt	100·0	..	..	..	..	..	..	Industrial Chemicals Pty. Ltd., 380 Collins-street, Melbourne
Windsor Block Lick	98·8	..	..	..	Trace	..	Mere Trace	A. H. McDonald, Co. Pty. Ltd., 568 Bridge-road, Richmond
Lim-o-Lik Salt Block ..	99·9	..	..	..	·1	..	Mere Trace	New Zealand Loan and Mercantile Agency Co. Ltd., 538–544 Collins street, Melbourne
Bone Meal, &c.								
Cockbill's Bone Meal	..	21·70	27·60	..	..	..	..	W. and J. Cockbill, Footscray-road, Footscray
Apex Sterilized Bone Meal ..	..	24·0	28·0	..	..	..	..	North Eastern Bone Products, Wangaratta
Nuelife Bone Meal	..	24·50	32·00	..	..	..	..	E. F. Peters and Sons Pty. Ltd., Dunolly
G.B.P. Bone Meal	..	23·00	30·00	..	..	..	..	Ronchi Bros., 87 Raymond-street, Sale
Tricalos Sterilized Bone Flour ..	..	32·50	40·00	..	..	..	..	Glues and By-Products Pty. Ltd., 86 King-street, Melbourne
Cockbill's Bone Grit	..	20·00	25·27	..	..	..	..	W. and J. Cockbill, Footscray-road, Footscray
Clark's Bone Meal	..	21·00	46·0	..	..	..	..	Clark, King, and Co. Pty. Ltd., 237 Queen-street, Melbourne
Champion Bone Meal ..	..	21·00	30·0	..	..	..	..	H. C. Pannifex and Co. Pty. Ltd., 4 Dudley-street, Melbourne
Miscellaneous.								
C.F.C. Di-Calcic Phosphate ..	..	37·50	29·57	..	..	..	..	Commonwealth Fertilizers and Chemicals Ltd., 65 William-street, Melbourne
C.F.C. Di-Calcic Lick, No. 1 ..	65·00	9·38	7·39	..	..	..	..	Commonwealth Fertilizers and Chemicals Ltd., 65 William-street, Melbourne
C.F.C. Di-Calcic Lick, No. 2 ..	71·00	5·63	4·44	·49	·29	5·00	..	Commonwealth Fertilizers and Chemicals Ltd., 65 William-street, Melbourne
C.F.C. Di-Calcic Lick, No. 2 (with Iodine)	71·00	5·63	4·44	·49	·29	5·00	·05	Commonwealth Fertilizers and Chemicals Ltd., 65 William-street, Melbourne
C.F.C. Di-Calcic Concentrate, No. 3	..	23·44	18·48	2·03	1·20	20·83	..	Commonwealth Fertilizers and Chemicals Ltd., 65 William-street, Melbourne
C.F.C. Di-Calcic Concentrate, No. 3 (with Iodine)	..	23·44	18·48	2·03	1·20	20·83	·19	Commonwealth Fertilizers and Chemicals Ltd., 65 William-street, Melbourne
C.F.C. Bone Lick (with Iodine)..	61·00	6·53	8·28	·49	·29	5·00	·05	Commonwealth Fertilizers and Chemicals Ltd., 65 William-street, Melbourne
C.F.C. Ground Phosphate ..	..	36·65	49·50	..	..	..	..	Commonwealth Fertilizers and Chemicals Ltd., 65 William-street, Melbourne
Cresco Di-Calcic Lick, No. 1 ..	65·00	6·50	6·50	..	..	..	..	Cresco Fertilizers Ltd., Geelong
Cresco Di-Calcic Lick, No. 2 ..	71·00	3·80	3·80	·30	·20	4·50	·04	Cresco Fertilizers Ltd., Geelong
Cresco Di-Calcic Lick ..	90·00	2·50	2·50	..	..	..	..	Cresco Fertilizers Ltd., Geelong
Cresco Concentrated Di-Calcic Lick	..	25·00	25·00	..	..	..	..	Cresco Fertilizers Ltd., Geelong
Cresco Calcium Phosphate Lick	65·00	1·30	16·00	..	..	..	..	Cresco Fertilizers Ltd., Geelong
Cresco Calcium Phosphate Copper Lick	58·00	1·30	18·50	..	..	..	..	Cresco Fertilizers Ltd., Geelong
Cresco Calcium Phosphate Copper Iodine Lick	67·50	1·30	13·50	..	..	..	·35	Cresco Fertilizers Ltd., Geelong
Cresco Calcium Copper Lick ..	65·00	..	16·00	..	..	..	..	Cresco Fertilizers Ltd., Geelong
Cresco Calcium Copper Iodine Lick	65·00	..	15·90	..	..	..	·35	Cresco Fertilizers Ltd., Geelong

LIST OF STOCK FOODS AND STOCK LICKS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE STOCK FOODS ACT 1936, No. 4382, FOR THE YEAR 1939—*continued.*

Distinguishing Brand Name.	Guaranteed Composition.							Where Obtainable.
	Salt.	Phosphoric Acid.	Lime.	Magnesia.	Iron. (as Fe_2O_3).	Sulphur.	Iodine.	
STOCK LICKS—*continued.*	% (Max.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	
Miscellaneous.—continued.								
Vic-Lic Sheep Lick D ..	..	28·77	30·57	..	4·28	..	·03	Wilcox Mofflin Ltd., Henty House, 499 Little Collins-street, Melbourne
Vic-Lic Sheep Lick G ..	..	29·02	31·10	..	7·37	..	·03	Wilcox Mofflin Ltd., Henty House, 499 Little Collins-street, Melbourne
Vigoreen Concentrate ..	15·00	11·00	16·80	1·95	1·50	6·00	·09	Victor Leggo and Farmers Ltd., 222 Queen-street, Melbourne
Osmond's Concentrated Lick ..	..	15·0	12·00	1·2	·7	12·0	·04	Osmond and Sons (Aust.) Pty. Ltd., 35 William-street, Melbourne
Osmond's Toneca Stock Lick ..	75·0	6·0	2·50	·2	·3	2·5	·04	Osmond and Sons (Aust.) Pty. Ltd., 35 William-street, Melbourne
Salvitis Lick	90·0	1·8	2·50	·2	·8	·4	..	Cheetham Salt Pty. Ltd., 71 Little Malop-street, Geelong
Salvitis Concentrate	..	18·7	25·00	2·1	8·4	4·4	..	Cheetham Salt Pty. Ltd., 71 Little Malop-street, Geelong
Calphosfer	..	23·70	29·1	·30	5·8	..	..	Hamilton Laboratories Pty. Ltd., 532 Bourke-street, Melbourne
C-Lik	22·0	8·00	20·00	4·00	3·0	..	..	Deepsea Stock Foods, 527 Collins-street, Melbourne
Mineralox	22·0	8·00	20·00	4·00	3·0	..	..	Deepsea Stock Foods, 527 Collins-street, Melbourne
Vita Lick Concentrated D ..	..	13·00	17·30	1·30	1·7	8·0	Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita Lick Concentrated G ..	..	19·50	25·90	1·30	1·7	8·0	Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita-Lick Mixed D	75·0	2·40	3·20	·25	·33	1·5	Mere Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita-Lick Mixed G	75·0	3·67	4·93	·25	·33	1·5	Mere Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita-Lick Extra Strength Mixed D	62·0	4·00	5·35	·40	·55	2·5	Mere Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita Lick Extra Strength Mixed G	62·0	6·10	8·10	·40	·55	2·5	Mere Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Por-co-vite	12·8	19·20	24·30	·83	·30	10·0	Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Chic-a-vite	..	20·70	27·60	1·43	1·80	1·8	Mere Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita Lick Mineralized Block ..	82·0	2·15	4·90	·83	·10	..	..	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Carbofos Mineralized Block ..	77·0	4·30	7·75	·80	·10	..	..	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita Lick Red Blocks ..	82·0	2·15	4·90	·83	·55	..	Merest Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita Lick Cattle Lick Concentrated D	..	15·77	20·50	1·33	·90	2·10	Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita Lick Cattle Lick Concentrated G	..	20·55	26·70	1·33	1·80	2·10	Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita Lick Cattle Lick Mixed D ..	74·0	2·84	3·70	·24	·17	·39	Merest Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita Lick Cattle Lick Mixed G..	74·0	3·76	4·91	·24	·35	·39	Merest Trace	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Vita Lick Mineralized Salt Fodder	25·0	..	..	·63	·15	..	..	Vita-Lick Pty. Ltd., 493–495 Collins-street, Melbourne
Foddalik (FL in square) ..	..	13·00	27·60	5·60	1·10	..	Merest Trace	The Mineral Foods Co. of Australia Pty. Ltd., Henty House, Little Collins-street, Melbourne
Alikon Block Lick	91·0	1·90	3·00	..	..	..	..	Alikon Pty. Ltd., 36 Clarendon-street, South Melbourne
Alikon Lick, No. 1	8·0	19·00	30·00	..	1·00	..	Trace	Alikon Pty. Ltd., 36 Clarendon-street, South Melbourne
Immunolic Concentrate ..	8·0	19·00	30·00	..	1·00	..	Trace	Hart and Co. Pty. Ltd., 72–86 Whiteman-street, South Melbourne
Immunol Block Lick	91·0	1·90	3·00	..	..	..	..	Hart and Co. Pty. Ltd., 72–86 Whiteman-street, South Melbourne
Sulphurized Block Lick ..	98·0	..	..	..	..	2·00	..	Hart and Co. Pty. Ltd., 72–86 Whiteman-street, South Melbourne
Alikon, Lick No. 2	5·0	15·00	25·00	..	1·00	1·0	Trace	Alikon Pty. Ltd., 36 Clarendon-street, South Melbourne
Alikon Organic Lime Compound	..	..	7·00	..	..	..	..	Alikon Pty. Ltd., 36 Clarendon-street, South Melbourne
Hart's Immunol Organic Lime Compound	..	..	7·00	..	..	..	..	Hart and Co. Pty. Ltd., 72–86 Whiteman-street, South Melbourne
Vic-Lic Mixed G	78·0	5·50	6·00	..	1·4	..	Trace	Wilcox Mofflin Ltd., Henty House, 499 Little Collins-street, Melbourne
Vic-Lic Mixed D	78·0	5·50	6·00	..	·7	..	Trace	Wilcox Mofflin Ltd., Henty House, 499 Little Collins-street, Melbourne
Vic-Lic Concentrated	5·0	29·02	31·10	..	4·28	..	Trace	Wilcox Mofflin Ltd., Henty House, 499 Little Collins-street, Melbourne

LIST OF STOCK FOODS AND STOCK LICKS REGISTERED AT THE OFFICE OF THE DIRECTOR OF AGRICULTURE UNDER THE STOCK FOODS ACT 1936, No. 4382, FOR THE YEAR 1939—*continued.*

Distinguishing Brand Name.	Guaranteed Composition.							Where Obtainable.
	Salt.	Phosphoric Acid.	Lime.	Magnesia.	Iron. (as Fe_2O_3).	Sulphur.	Iodine.	
STOCK LICKS—*continued.*	% (Max.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	% (Min.)	
Miscellaneous.—continued.								
Evans Specific	..	3·00	13·40	2·22	40·00	10·00	Trace	Thomas' Sheep and Cattle Dips Pty. Ltd., 47 Adam-street, Burnley
C & B Tonic Mineral	63·00	12·07	9·50	·70	·40	7·70	..	J. S. Brewer, Rossiter's-road, Koowee-rup
Pegalick	38·0	13·5	17·5	..	·20	4·20	·04	Pegasus Pty. Ltd., 56 Hunter-street, Sydney
Kelp-Lik	..	23·00	32·00	1·50	1·40	10·00	..	Kelp-Lik Products Pty. Ltd., 343 Little Collins-street, Melbourne
Nutra-Min "A"	38·80	7·38	26·74	·60	·43	1·60	Trace	S. N. Rodda Pty. Ltd., 47 William-street, Melbourne
Vetsolick	Trace	19·00	26·20	·65	1·55	14·20	Trace	A. H. McDonald Pty. Ltd., 568 Bridge-road, Richmond
Rudduck's Medicated Tonic ..	60·0	8·20	7·80	·71	..	5·20	..	Rudduck and Co. Pty. Ltd., 556 Lonsdale-street, Melbourne
Rudduck's Improved Mineral Lick	20·0	16·00	24·00	·60	·88	2·00	Trace	Rudduck and Co. Pty. Ltd., 556 Lonsdale-street, Melbourne
Rudduck's Tonic and Vermicide	..	18·80	26·00	1·00	1·30	·50	·04	Rudduck and Co. Pty. Ltd., 556 Lonsdale-street, Melbourne
Allkon Mineral Poultry Food ..	4·0	11·0	30·0	..	·5	·5	Trace	Allkon Pty. Ltd., 36 Clarendon-street, South Melbourne
Allkon Organic Lime Compound (Special)	..	..	7·0	..	..	..	3·0 (Fat)	Allkon Pty. Ltd., 36 Clarendon-street, South Melbourne
Wagstaff's Medicated Salt Compound	59·2	6·5	8·5	Trace	·37	3·2	Trace	B. Wagstaff, 7–9 Kavanagh-street, South Melbourne
Wagstaff's Mineral Concentrate	..	19·0	20·0	·65	1·55	14·2	..	B. Wagstaff, 7–9 Kavanagh-street, South Melbourne
Vetamac Mineralized Block Lick	84·0	3·1	4·3	·11	·30	2·4	Trace	A. H. McDonald, 568 Bridge-road, Richmond
Welco Concentrated Stock Lick	1·0	20·0	38·0	·12	2·40	..	·15	Welch, Perrin and Co. Pty. Ltd., 48–56 Queensbridge-street, South Melbourne
Aminac Stock Lick	..	22·5	28·0	..	..	..	..	J. Kitchen and Sons, Pty. Ltd., Ingles-street, Port Melbourne
Vi-Minerol	8·0	1·5	6·5	·25	·65	5·5	·40	Felton, Grimwade and Duerdins Ltd., 342 Flinders-street, Melbourne
Tricalik Mineral Supplement ..	..	31·78	44·4	..	·50	..	Trace	New Zealand Loan and Mercantile Agency Co. Ltd., 538–544 Collins-street, Melbourne
Osmond's Sheep Lick ..	..	9·0	7·0	1·3	·60	2·0	Trace	Osmond and Sons (Aust.) Pty. Ltd., 35 William-street, Melbourne
Salvitis Mixed Lick, No. 2 ..	70·0	7·1	8·8	·2	·80	4·0	..	The Cheetham Salt Pty. Ltd., Malop-street, Geelong
Salvitis Ready Mixed, No. 2 ..	70·0	7·1	8·8	·2	·80	4·0	..	The Cheetham Salt Pty. Ltd., Malop-street, Geelong
Salvitis Iodised	90·0	1·8	2·5	·2	·80	·4	Trace	The Cheetham Salt Pty. Ltd., Malop-street, Geelong
Salvatis Iodised Concentrate ..	..	18·7	25·0	2·1	4·4	8·4	·50	The Cheetham Salt Pty. Ltd., Malop-street, Geelong
Windsor Block Lick	98·0	..	..	..	..	2·0	..	A. H. McDonald, and Co. Pty. Ltd., 568 Bridge-road, Richmond
Wellesley Mineral Concentrate (Horses)	..	21·75	21·69	3·33	..	3·0	·10	Wellesley Stock Medicine Co., 253 Dorcas-street, South Melbourne
Wellesley Iodised Mineral Concentrate (Medium)	..	29·5	29·0	6·0	·75	2·75	·10	Wellesley Stock Medicine Co., 253 Dorcas-street, South Melbourne
Wellesley Iodised Mineral Concentrate (Cattle)	..	27·96	26·56	3·33	..	2·75	·10	Wellesley Stock Medicine Co., 253 Dorcas-street, South Melbourne
Wellesley Iodised Mineral Concentrate (Clover)	..	25·0	25·0	5·0	·70	3·0	·10	Wellesley Stock Medicine Co., 253 Dorcas-street, South Melbourne
Hart's 10% Bone Meal Blocks ..	91·0	2·5	3·5	..	..	..	..	Hart and Co. Pty. Ltd., 72–86 Whiteman-street, South Melbourne
Hart's Bone Meal and Protein Blocks	91·0	1·2	1·7	..	..	..	..	Hart and Co. Pty. Ltd., 72–86 Whiteman-street, South Melbourne
Hart's Immunol Organic Lime Compound Special	..	..	7·0	..	..	..	..	Hart and Co. Pty. Ltd., 72–86 Whiteman-street, South Melbourne

Melbourne, 23rd March, 1939.

W. R. JEWELL, M.Sc.,
Chemist for Agriculture.

Burnley Egg-Laying Competition, 1938-39—Prize List

SECTION A.—TEAMS OF SIX BIRDS, TRAP-NESTED.

Pen No.	Name and Address.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.			
	First Prize—Champion Certificate, also Second Prize Burnley Sash.			
2	F. W. Becker, 103 Clarence-street, Geelong West	1,558	..	1,558
	Second Prize—Government Certificate, also Third Prize Burnley Sash.			
10	C. and D. McLauchlan, 144 Through-road, Burwood, E.13	1,383	16	1,367
	Third Prize—Government Certificate.			
25	J. F. Cowan, "Rosebuds," Bacchus Marsh	1,323	4	1,319
	Class 2.—White Leghorns—Dry Mash.			
	First Prize—Champion Certificate.			
32	C. R. Fagg, 76 Maud-street, Geelong	1,237	14	1,223
	Second Prize—Government Certificate.			
37	J. M. Sutherland, Fulton-road, Box Hill	1,228	6	1,222
	Class 4.—Australorps—Wet Mash.			
	First Prize—Champion Certificate; Burnley Champion Sash, also Special Certificate for exceeding Burnley Record for 12 months.			
57	J. Herbert, 13 Dunn-street, Wonthaggi	1,648	6	1,642
	Second Prize—Government Certificate.			
66	W. A. Shevill, 35 Bourke-street, Mentone, S.11	1,377	26	1,351
	Third Prize—Government Certificate.			
58	Mrs. S. A. Kelly, 214 Pascoe Vale-road, Pascoe Vale	1,345	19	1,326
	Class 5.—Rhode Island Reds—Wet Mash.			
	First Prize—Champion Certificate.			
42	Pine View Poultry Farm (R. Willmott, 3 Monteath-avenue, Hawthorn, E.3)	1,051	2	1,049
	Second Prize—Government Certificate.			
40	H. Dibbs, 3 Balfe-crescent, West Brunswick, N.12	1,046	..	1,046

SECTION B.—INDIVIDUAL BIRDS—SINGLE TEST.

Pen No.	Name and Address.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.			
	First Prize—Champion Certificate.			
1	E. Abikhair, 41 Wilfred-road, Ivanhoe, N.21	280	..	280
	Second Prize—Government Certificate.			
3	Aitken and Grenville, Silver-street, Cheltenham, S.22	282	7	275
	Equal Third Prize—Government Certificate.			
20	A. T. Dent, "Ridgeway," Edward-street, Greensborough	273	..	273
	Equal Third Prize—Government Certificate.			
86	T. A. Welch, 10 Hayes-road, North Essendon, W.6	278	5	273
	Class 2.—White Leghorns—Dry Mash.			
	First Prize—Champion Certificate.			
219	M. G. Skinner, 75 Vincent-street, Sandringham, S.8	279	1	278
	Second Prize—Government Certificate.			
208	H. I. Jolly, Ace Poultry Farm, Nelson-road, Trafalgar	260	..	260
	Third Prize—Government Certificate.			
207	H. I. Jolly, Ace Poultry Farm, Nelson-road, Trafalgar	257	..	257
	Class 4.—Australorps—Wet Mash.			
	First Prize—Champion Certificate; also Burnley Champion Sash.			
117	J. Grass, 44 Station-street, Burwood	294	..	294
	Second Prize—Government Certificate; also Second Prize Burnley Sash.			
112	W. Cullen, Werribee Poultry Farm, Werribee	285	1	284
	Third Prize—Government Certificate; also Third Prize—Burnley Sash			
122	C. H. Harvey, Pakenham South	285	2	283
	Class 5.—Rhode Island Reds—Wet Mash.			
	First Prize—Champion Certificate.			
166	R. Farrin-Webb, "Rafa," Traralgon (Rhode Island Red)	258	2	256

PRIZE LIST.—*continued.*

SECTION B.—INDIVIDUAL BIRDS, SINGLE TEST.
—continued.

Pen No.	Name and Address.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 5.—Rhode Islands—Wet Mash.—*continued.*			
	SECOND PRIZE—GOVERNMENT CERTIFICATE.			
161	J. Chatts, White-street, Beaumaris, S.10 (Rhode Island Red)	243	..	243
	THIRD PRIZE—GOVERNMENT CERTIFICATE.			
159	J. W. Hattwell, 44 Ebden-street, Elsternwick, S.4 (Rhode Island Red)	233	2	231
	Class 5.—All Heavy Breeds other than Australorps and Rhode Islands—Wet Mash.			
	FIRST PRIZE—CHAMPION CERTIFICATE.			
192	H. R. Cropley, Coast-road, Mirboo North (Light Sussex)	251	..	251
	SECOND PRIZE—GOVERNMENT CERTIFICATE.			
193	C. and D. McLauchlan, 144 Through-road, Burwood, E.13 (Light Sussex)	231	3	228

YOUNG FARMERS' CLUB SECTION.

Pen No.	Name and Address.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 2.—Australorps—Wet Mash.			
	FIRST PRIZE—CHAMPION CERTIFICATE.			
156	Mickleham Young Farmer's Club (Marjorie Parker, Mickleham) (Aust.)	238	..	238
	SECOND PRIZE—GOVERNMENT CERTIFICATE.			
158	Mickleham Young Farmer's Club (Flora Rhodes, Mickleham) (Aust.)	225	..	225
	THIRD PRIZE—GOVERNMENT CERTIFICATE.			
155	Mickleham Young Farmer's Club (Marjorie Parker, Mickleham) (Aust.)	224	2	222

SECTION A.—FOR THE GREATEST NUMBER OF FIRST GRADE EGGS LAID BY INDIVIDUAL BIRDS IN EACH CLASS SECTION A.

Pen No.	Name and Address.	Bird No.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.				
	FIRST PRIZE—CHAMPION CERTIFICATE.				
2	F. W. Becker, 103 Clarence-street, Geelong West	11	293	..	293

Section A.—First Grade Eggs by Individual Birds— *continued.*

Pen No.	Name and Address.	Bird No.	Total Eggs.	Under-weight.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.—*continued.*				
	SECOND PRIZE—GOVERNMENT CERTIFICATE.				
2	F. W. Becker, 103 Clarence-street, Geelong West	9	280	..	280
	THIRD PRIZE—GOVERNMENT CERTIFICATE.				
2	F. W. Becker, 103 Clarence-street, Geelong West	8	279	..	279
	Class 2.—White Leghorns—Dry Mash.				
	FIRST PRIZE—CHAMPION CERTIFICATE.				
30	Aitken and Grenville, Silver-street, Cheltenham, S.22	175	242	..	242
	SECOND PRIZE—GOVERNMENT CERTIFICATE.				
32	C. R. Fagg, 76 Maud-street, Geelong	190	243	3	240
	THIRD PRIZE—GOVERNMENT CERTIFICATE.				
35	M. G. Skinner, 75 Vincent-street, Sandringham, S.8	209	230	..	230
	Class 4.—Australorps—Wet Mash.				
	FIRST PRIZE—CHAMPION CERTIFICATE.				
57	J. Herbert, 13 Dunn-street, Wonthaggi	338	290	2	288
	SECOND PRIZE—GOVERNMENT CERTIFICATE.				
57	J. Herbert, 13 Dunn-street, Wonthaggi	341	286	..	286
	THIRD PRIZE—GOVERNMENT CERTIFICATE.				
57	J. Herbert, 13 Dunn-street, Wonthaggi	340	285	2	283
	Class 5.—Rhode Island Reds—Wet Mash.				
	FIRST PRIZE, CHAMPION CERTIFICATE.				
42	Pine View Poultry Farm (R. Willmott), 3 Monteath-avenue, Hawthorn, E.3	247	235	..	235
	SECOND PRIZE—GOVERNMENT CERTIFICATE.				
40	H. Dibbs, 3 Balfe-crescent, West Brunswick, N.12	238	224	..	224
	EQUAL THIRD PRIZE, GOVERNMENT CERTIFICATE.				
41	S. N. Lloyd, Cranbourne-road, Frankston	244	207	3	204
	EQUAL THIRD PRIZE—GOVERNMENT CERTIFICATE.				
46	R. H. Woods, "Nestor," Fewster-road, Hampton	274	204	..	204

PRIZE LIST—*continued.*

Section A.—*continued.*

SECTION A.—FIRST CLASS CERTIFICATES OF MERIT TO TEAMS IN CLASSES 1, 2, AND 4, WHICH LAID 1,200 FIRST GRADE EGGS, AND IN CLASSES 3 AND 5, WHICH LAID 1,000 FIRST GRADE EGGS.

Pen No.	Name and Address.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.	
5	H. B. Goeby, Hilton-street, Glenroy, W.9	1,316
7	H. I. Jolly, Ace Poultry Farm, Nelson-road, Trafalgar	1,302
13	T. A. Pettigrove, 159 Hawdon-street, Heidelberg, N.22	1,289
4	T. L. Eastaugh, Point Nepean-road, Highett, S.21	1,276
15	Hillcrest Poultry Farm (E. T. Purser), Everard-road, Ringwood East	1,271
8	S. N. Lloyd, Cranbourne-road, Frankston	1,247
24	Squirrell Bros., Tulip-street, Cheltenham, S.22	1,213
20	P. C. and E. Thomson, 142 Fyans-street, South Geelong	1,204
	Class 4.—Australorps—Wet Mash.	
55	C. E. Graham, Portarlington	1,289
51	Aitken and Grenville, Silver-street, Cheltenham, S.22	1,262
69	J. Taylor, 38 Milroy-street, Brighton, S.6	1,234

FIRST CLASS CERTIFICATES OF MERIT TO INDIVIDUAL BIRDS IN CLASSES 1, 2, AND 4, WHICH LAID 220 FIRST GRADE EGGS, AND IN CLASSES 3 AND 5, WHICH LAID 200 FIRST GRADE EGGS.

Pen No.	Name and Address.	Bird No.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.		
2	F. W. Becker, 103 Clarence-street, Geelong West	7	241
	,, ,, ,, ,,	12	251
10	C. and D. McLauchlan, 144 Through-road, Burwood, E.13	55	278
	,, ,, ,, ,,	57	221
	,, ,, ,, ,,	58	264
	,, ,, ,, ,,	59	242
	,, ,, ,, ,,	60	232
25	J. F. Cowan, "Rosebuds," Bacchus Marsh	147	236
	,, ,, ,, ,,	148	226
	,, ,, ,, ,,	149	242
5	H. B. Goeby, Hilton-street, Glenroy, W.9	25	231
	,, ,, ,, ,,	27	245
	,, ,, ,, ,,	28	231
7	H. I. Jolly, Nelson-road, Trafalgar	37	270
	,, ,, ,, ,,	39	228

Section A.—*continued.*

Pen No.	Name and Address.	Bird No.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash—*continued.*		
7	H. I. Jolly, Nelson-road, Trafalgar	40	253
	,, ,, ,, ,,	41	259
	,, ,, ,, ,,	42	240
13	T. A. Pettigrove, 159 Hawdon-street, Heidelberg, N.22	73	236
	,, ,, ,, ,,	74	236
	,, ,, ,, ,,	76	248
	,, ,, ,, ,,	77	228
4	T. L. Eastaugh, Point Nepean-road, Highett, S.21	19	236
	,, ,, ,, ,,	23	222
	,, ,, ,, ,,	24	229
15	Hillcrest Poultry Farm (E. T. Purser), Everard-road, Ringwood East	88	257
8	S. N. Lloyd, Cranbourne-road, Frankston	44	225
	,, ,, ,, ,,	46	256
24	Squirrell Bros., Tulip-street, Cheltenham, S.22	140	268
	,, ,, ,, ,,	143	246
20	P. C. and E. Thomson, 142 Fyans-street, South Geelong	116	236
11	Maroo Poultry Farm (B. E. Prendergast), 30 Maroo-street, Oakleigh, S.E.12	61	245
	,, ,, ,, ,,	62	234
	,, ,, ,, ,,	65	243
	,, ,, ,, ,,	66	225
18	J. A. Stewart, Maldon-road, Castlemaine	104	246
1	Aitken and Grenville, Silver-street, Cheltenham, S.22	3	233
22	A. J. Hill, Sunraysia Poultry Farm, Greensborough	128	223
21	J. H. Wernli, Wilson-street, Cheltenham, S.22	126	224
19	J. M. Sutherland, Fulton-road, Box Hill	114	229
23	L. Magnusson, Private Bag, Nathalia	138	235
6	"Ibrox" (J. Brown), 30 Hopetoun-grove, Ivanhoe, N.21	31	225
	,, ,, ,, ,,	34	225
17	A. Smith and Son, Terang ..	98	260
14	A. S. Pittock, Ozone Poultry Farm, Dalgety-road, Beaumaris, S.10	83	231
	,, ,, ,, ,,	84	226
	Class 2.—White Leghorns—Dry Mash.		
37	J. M. Sutherland, Fulton-road, Box Hill	218	225
	,, ,, ,, ,,	221	221
35	M. G. Skinner, 75 Vincent-street, Sandringham, S.8	207	223
34	Molson's White Leghorn Stud (W. E. Molson), 188 Surrey-road, Blackburn	100	221
	,, ,, ,, ,,	104	229
31	W. P. de Hugard, 33 Simpson-road, Box Hill	185	225

PRIZE LIST.—*continued.*

Section A.—*continued.*

Pen No.	Name and Address.	Bird No.	First Grade Eggs.
	Class 4.—Australorps—Wet Mash.		
57	J. Herbert, 13 Dunn-street, Wonthaggi	337	244
	,, ,, ,, ,,	339	281
	,, ,, ,, ,,	342	260
66	W. A. Shevill, 35 Bourke-street, Mentone, S.11	391	230
	,, ,, ,, ,,	393	229
	,, ,, ,, ,,	395	268
	,, ,, ,, ,,	396	256
58	Mrs. S. A. Kelly, 214 Pascoe Vale-road, Pascoe Vale	343	248
	,, ,, ,, ,,	344	253
	,, ,, ,, ,,	346	222
	,, ,, ,, ,,	347	274
55	C. E. Graham, Portarlington ..	327	241
	,, ,, ,, ..	330	226
51	Aitken and Grenville, Silver-street, Cheltenham, S.22	304	229
	,, ,, ,, ,,	306	262
69	J. Taylor, 38 Milroy-street, Brighton, S.6	413	245
63	A. C. Moran, 48 Marina-road, Mentone	376	231
	,, ,, ,, ,,	377	240
52	Mrs. B. E. Bradstreet, 76 Railway-road, Carnegie, S.E.9	310	234
	,, ,, ,, ,,	312	220
53	W. Cullen, Werribee Poultry Farm, Werribee	314	250
	,, ,, ,, ,,	316	235
61	Mrs. D. Mason, Mt. Evelyn-road, Lilydale	365	250
64	T. A. Pettigrove, 159 Hawdon-street, Heidelberg, N.22	383	225
	,, ,, ,, ,,	384	226
70	D. and J. Tresise, Serpentine ..	417	269
56	C. H. Harvey, Pakenham South ..	333	226
59	S. N. Lloyd, Cranbourne-road, Frankston	353	244
	,, ,, ,, ,,	354	249
68	J. A. Stewart, Maldon-road, Castlemaine	403	227

SECTION B.—FIRST CLASS CERTIFICATES OF MERIT TO HENS IN CLASSES 1, 2, AND 4, WHICH LAID 240 FIRST GRADE EGGS, AND IN CLASSES 3 AND 5, WHICH LAID 220 FIRST GRADE EGGS.

Pen No.	Name and Address.	First Grade Eggs.
	Class 1.—White Leghorns—Wet Mash.	
83	L. Magnusson, Private Bag, Nathalia ..	269
32	M. Heard, 48 Steele-street, Moonee Ponds, W.14	268
50	K. McKenzie, 82 Clarence-street, Geelong West	267
70	W. J. Roffey, Fyansford-road, Herne Hill, Geelong	267
21	T. L. Eastaugh, Point Nepean-road, Highett, S.21	266
52	J. R. Maddison, Red Cliffs P.O. ..	262

Section B—*continued.*

Pen No.	Name and Address.	First Grade Eggs.
	Class 1—White Leghorns—Wet Mash.—*continued.*	
57	F. C. Mason, 15 Landcox-street, North Brighton, S.6	262
92	O. Williams, "Kooyong," Middleboro-road, Box Hill	262
63	T. A. Pettigrove, 159 Hawdon-street, Heidelberg, N.22	261
53	Maroo Poultry Farm (B. E. Prendergast), 30 Maroo-street, Oakleigh, S.E.12	259
64	T. A. Pettigrove, 159 Hawdon-street, Heidelberg, N.22	259
56	Marywood Farm (A. Waugh), Bank-street, Kangaroo Flat	254
69	W. J. Roffey, Fyansford-road, Herne Hill, Geelong	254
37	Mrs. G. M. Jones, 162 Hall-street, Spotswood, W.14	252
5	All Varieties Poultry Farm (Mickleburough Bros.), Herald-street, Cheltenham, S.22	249
19	A. T. Dent, "Ridgeway," Edward-street, Greensborough	249
4	Aitken and Grenville, Silver-street, Cheltenham, S.22	248
44	Mrs. S. A. Kelly, 214 Pascoe Vale-road, Pascoe Vale	246
39	S. A. J. Jones, 162 Hall-street, Spotswood, W.14	245
54	Maroo Poultry Farm (B. E. Prendergast), 30 Maroo-street, Oakleigh, S.E.12	245
55	Marywood Farm (A. Waugh), Bank-street, Kangaroo Flat	245
58	F. C. Mason, 15 Landcox-street, North Brighton, S.6	242
34	A. Hewitt, Moray-street, Bentleigh, S.E.15	241
27	Elwers Bros., Yan Yean-road, Plenty ..	240
43	Mrs. S. A. Kelly, 214 Pascoe Vale-road, Pascoe Vale	240
	Class 2.—White Leghorns—Dry Mash.	
221	G. E. Thomas, "Rosanna," Chesterville-road, Cheltenham, S.22	256
230	Birdwood Stud Poultry Farm (T. L. Anthony), Glenburnie-road, Mitcham	253
	Class 4.—Australorps—Wet Mash.	
118	J. Grass, 44 Station-street, Burwood ..	269
133	P. Phelan, 11 Traill-street, Northcote, N.16	263
147	D. and J. Tresise, Serpentine	257
111	W. Cullen, Werribee Poultry Farm, Werribee	255
127	L. J. Mumford, Steele-street, Healesville	255
148	D. and J. Tresise, Serpentine	252
139	Mrs. W. S. Savory, 170 Prospect Hill-road, Canterbury, E.7	250
153	K. McKenzie, 82 Clarence-street, Geelong West	243

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